Digital photography and the digitalisation of foreign archives

Christopher Gennari
Camden County College,
Jefferson Hall 305, College Drive,
Blackwood, NJ 08012, USA
E-mail: cgennari@camdencc.edu

Abstract: Digital photography allows for the collection of large amounts of archival documents in a short period of time. This has many benefits for the researcher including a greater convenience of time, a dramatic savings of money, and an increased flexibility in using the documents. This essay describes my own experience using digital photography in the Riksarkivet in Stockholm, as well as the materials, methods, advantages and disadvantages of using a digital workflow for research.

Keywords: digital photography; national archives; images; foreign research; document mobility; doctoral research; digital technology.


Biographical notes: Christopher Gennari is an Assistant Professor of History at Camden County College in Blackwood New Jersey. He is completing his dissertation at the State University of New York at Stony Brook on the role of freedom and liberty in the military and political activity of King Charles X Gustav of Sweden during the Second Northern War (1655–1661). He is a hobbieist photographer who uses digital technologies to aid his research.

1 Introduction

Digital photographic technology can have a dramatic impact on conducting archival research by allowing the researcher to collect massive amounts of data both quickly and at little cost. This will allow researchers to use the documents anywhere in the world and effortlessly share these archival documents with colleagues thousands of kilometers away. Using easily assessable photographic and computer technology a researcher can amass a lifetime of research in a short trip to the archives allowing for a deeper level of long term scholarship. This essay will discuss the purposes, methods, materials, advantages and hindrances of a digital research workflow.

I would like to note that this project could not have happened without the help and willingness of the archivists of the Riksarkivet who were always friendly, helpful and willing to accept my constant requests for more folios to digitise. To them I owe many thanks.
My experience in Sweden and the Riksarkivet

In January 2007 I went to Sweden to conduct research in Sweden’s National Archives, the Riksarkivet, to support my dissertation on Charles X Gustav. As an US university student I was constrained by factors of time, space, income and, unexpectedly, source material. I only had the income and free time to support living in Sweden for about a month. Travel space restrictions on trans-atlantic flights limited my ability to perform massive photocopying; the sheer bulk weight (not to mention cost) of hundreds of photocopied pages made for a daunting endeavor. Because of these restrictions on my research flexibility I planned on making very specific use of the Riksarkivet materials by spending most of my time reading letters and documents at the archives, writing notes and translations into my accompanying notebooks, and photocopying the most important documents to transport back to the USA. This should have allowed me the time to find the materials necessary for my doctoral research while limiting the impact on time, weight, and cost.

My stumbling block turned out to be the source material itself. I was interested in letters to and from the Swedish king, Charles X, during the wars in Poland and Denmark in the 1650s. Those letters were expertly categorised and chronicled. The archives seemed to have accessible the documents of communication between all the various governmental and martial ministries. Unfortunately, 17th century handwriting was notoriously difficult to read. It was narrow, close together, in many cases nearly the entire page is filled with script making it difficult to know where a sentence finished or began. The archivists handed me a magnifying glass and a handwriting decoder photocopy and wished me luck. Suddenly, in leafing through a series of folios, I realised why very few Swedes and not a single English language historian had done large scale, archival level work on the reign of Charles X.

This created a major problem in the efficiency of my plan which depended upon efficiency. My plan had been to efficiently glide through letters searching out significant keywords or authors. Letters discussing military plans with his generals were very important to my research while correspondence relating the grain disputes on Lapland farms were outside my research purview. The nature of the documents themselves demanded the two things I did not have: time and money. I was an unfunded US graduate student living in Sweden for a month by using my own financial savings. I had to return to the USA by 1 February to begin teaching my spring semester courses. I did not have the financial wherewithal to use the traditional six months to a year for archival research. If I used the traditional method of reading documents and copying notes I would run out of time long before I would be able to find many of the necessary documents. This would necessitate a longer, more expensive, trip in the summer (when both airfares and apartment rents double while the Riksarkivet is open for less hours per day and is closed on the weekends) which was fiscally impossible. In short, I had to get as much material as possible before my time in Stockholm was up and bring it back to the USA with me.

Massive photocopying was also out of the question. The Christmas and New Year’s holiday had created what an archivist told me was a two week backlog of photocopying requests. Additionally, the weak exchange rate of the dollar made the four kronor cost of a photocopy prohibitively expensive for large scale copying of materials of dubious specific importance. One 200 page folio of letters to Charles X would have run US$114.00 to photocopy and I would have none of his responses. In two days my entire
pre-trip plan had come to ruin. Unable to read specific documents and incapable of mass copying there was nothing to do but find another solution.

Thankfully, the Riksarkivet would provide me one. I had come to Stockholm with as few things as possible for a month long trip. I had figured that the archives did not allow photography of their documents since it would cut into their photocopy revenue. But an off hand comment to the archivist in charge of microfilm led him to show me that not only did the Riksarkivet allow photography of their collections (without flash, of course, which would damage the documents over time) but had a base and arm setup for just the occasion. By screwing the camera’s tripod mount into the vertical arm, the photographer got a wide angle over head shot of any document he or she wished to put under it on the base. The manual controls of the arm allowed the camera to be zoomed in and out. The equipment, to the best of my knowledge, was meant for the small, compact camera to take a solitary photograph not of a document but of a map, painting or an engraving.

What I proposed to do was to take the minimal equipment of the Riksarkivet and use it not to reproduce a solitary copy of a painting or drawing but to digitise all of the materials relating to Charles X I could collect. This way I could return to the USA and read the documents, at high resolutions, at my leisure.

My solution to the problems of time, money and cost was a paradoxical one. I bought a high end camera which cost over a thousand US dollars. With all the accessories it probably cost me 1500 dollars. Had I brought the equipment from the USA (or purchased it there) I would have saved a lot of money. Still, it turned out to be a savings. At roughly 60 cents per photocopy this start up capital would have produced an immense 2500 pages. But those 2500 pages composed only half of one collection (Letters to the King – Section #1133). In addition of letters to the King, I needed the letters from the King, letters from government agencies to and from the King, diplomatic correspondence with foreign governments, and the official documents produced by the King and his traveling court in order to govern Sweden. The documents I eventually digitalised totaled around 25,000 images which equated to $15,000 in photocopies using 50 reams of A4 paper for a complete weight of half an US ton. To do this with a film camera would have required 695 thirty-six frame rolls of film costing $3,475 (about $5 a roll) and another $24,325 in development costs at a local retailer with another $1,400 to convert the images to CDs adding up to nearly $30,000 dollars. These 25,000 documents were transported, in my carry-on luggage, on a combination of my laptop hard drive and 15 recordable DVDs. Once back in the USA they were assembled, categorised and chronicled on my home desktop PC using a free program called Google Picassa.

Digital photography and computer technology allowed me to capture, transport, and manipulate a previously inconceivable amount of document at a tremendous savings of money. Additionally, my need for frequent return trips and long, expensive, stays in a foreign country to continue my research was eliminated. I have a lifetime worth of research documents at my fingers whenever I wish to conduct the research; 24 hours a day 365 days a year. For those researchers who are dedicated to international, especially trans-oceanic, research using a large number of documents this method is both cost effective, time efficient and allows flexible use of documents a photocopy or microfilm print would never allow.
3 Materials for personal archival folio digitalisation

The most important, and most expensive, component of digitalising folio based documents is a Digital SLR camera (DSLR). A DSLR is a digital camera which allows the user to look through the lens using a prism. In this manner, the photographer can compose the photograph by seeing what the lens sees; allowing the researcher to zoom in or out to fill the photograph with the largest amount of archival document material. A DSLR also allows the user to change lenses which allows the camera to adapt to nearly all situations. Good lenses can easily be more expensive than the camera. I used a Canon 400D and the included 18–55 mm lens (which I used at the wide end of 18–35 mm).

Several researchers at the Riksarkivet used the more common ‘Point and Shoot’ (PnS) digital cameras to digitalise single, isolated, documents. The PnS cameras are far cheaper, smaller and lighter than DSLR cameras but have neither the image resolution, lens flexibility, nor grainless images of a DSLR. Most PnS cameras also do not have the speed to shoot in low light situations, like an archive’s reading room, without a flash. They certainly do not have the speed for high workflow and very few allow for the use of a remote shutter control which means the photographer will have to touch the camera to take the photograph; at the slow speeds and large apertures required to get a sharp, well detailed shot, this will translate into camera shake and image blur. The PnS camera is fine for the solitary images many of the researchers at the Riksarkivet needed but it is impractical for mass digitalisation of documents.

The DSLR allows several important advantages when digitalising an archive. First, it allows the researcher to set the aperture of the lens. The aperture controls the amount of light which comes through the lens. A lens is sharpest between F8 and F11 making it the best range for photographing documents to view later on a computer monitor. Second, the computer chip within a DSLR is several times larger than the chips within a PnS camera allowing the DSLR to shoot the same photo with far less noise degradation than a PnS. Noise is akin to the grain of a film photo and the more of it in a photograph the harder it will be to examine the details of an image.

Third, the DSLR is designed to meter the image, focus the lens, and fire the shutter within hundredths of a second. The camera is ready to fire before you can turn the folio page. Since the researcher will be shooting at an aperture of f/8–11 the entire document will already be within the depth of focus of the lens which means that once the lens is focused it does not need to be readjusted during the photographing for all but the thickest of folios.

Once the camera and lens have been procured now one needs to obtain the necessary accessories. A large capacity storage card, of at least one gigabyte, will be necessary. The larger the car’s storage capacity the more images can fit it allowing the user more photographing and less downloading to a portable computer. I bought several cards so that I could swap the cards and continue shooting images onto the second card while the first card was downloading images into the computer. To download into your computer you need some kind of input device. Some laptops come with storage card readers already built in; otherwise an external device, which connects via the USB port, will be necessary. Both items are fairly inexpensive in the USA.

A second or even a third battery is also necessary. While battery technology, like storage card capacity, is increasingly getting better; current cameras will reliably get only about 500 images per battery charge. This translated into a half days work or less. Having two or three batteries will allow you to continue shooting while previously used batteries...
are recharging. Of course, starting the day with several fully charged batteries is the best way of getting the most use out of the technology. I found that I needed two batteries most of the time and several times, when I was really able to get a lot done, I needed to reuse a semi-charged battery (I had two batteries: one which came with the camera and an extra purchased one). In my apartment at night I would charge one in the evening and then put the second one in the charger before going to bed. This assured I had two fully charged batteries ready to go the next day. Since the batteries are the lifeblood of the camera, the more you use the various electrical accruements of the camera (auto focus, the LCD display, flash) the quicker you will use up the battery power. Fortunately, these processes are not required for every shot though the researcher should occasionally check the settings to make sure they are getting the optimal image.

A remote shutter controller is also necessary for getting the sharpest photographs. The low light levels of an archive reading room will require slow shutter speeds. The human body is simply too active to provide the stability to achieve sharp results at 1/10th or 1/25th of a second. This is the next reason why a DSLR is better than a PnS camera. All major bands of DSLR allow the use of a remote shutter control (wired or wireless) allowing a photographer to click the shutter without touching the camera. This allows for the sharpest image and the highest throughput since one can click the shutter with one hand while flipping a folio page with the other.

Finally, the last piece of the equipment depends on the archive. The Riksarkivet in Stockholm had a professional copy stand available. The copy stand had a flat base, on which to place and straighten the document, attached to a three foot tall arm with a tripod attachment. The arm had manual motion controls so I could zoom in and out to better frame the image. This allowed me to attach the camera, set the height, compose the image, and replicate the procedure in an efficient and productive manner. Otherwise I would have had to bring a tripod with me on which to place the camera.

Both the copy stand and the tripod allow me to shoot an image at slow shutter speeds and narrow apertures providing the best possible image. When I digitalised the Papers of John Thurloe (at Stony Brook University in New York) I had to bring my own tripod which proved a bit trickier to use. Luckily, the archivists did not mind my use of the equipment and simply wished for a copy of the images at the end of my work allowing them to save the source material from damage while simultaneously providing a high grade digital copy of the original. Without a stable base on which to work there will be little chance of achieving the photographic resolution needed for continued research. There will also be a large spectrum in the quality of the work produced; with some documents being very sharp while others will be fuzzy or totally out of focus. The constant vigilance required to make sure that each photograph is of acceptable quality will slow the work to an unusable crawl. A stabilised platform allows the photographer to calibrate the equipment and compose the image in a manner which will require few checks to determine its continued suitability.

Once the researcher get home he or she will need the computer infrastructure to support mass image organisation. The computer will need to be relatively fast, have large hard drive capacity, good amounts of memory (RAM), a good viewing monitor, and an image organisation software application. Any recent computer should come with enough speed and RAM to allow a seamless viewing of the images. A good monitor, like high resolution LCD displays, will allow very clear viewing of the images. The most important, and fickle, part of the computer is the software. I use Google’s Picassa which is a free application and is a very fast image viewer. It allows me to store the images
Digital photography and the digitalisation of foreign archives

where I wish while allowing me easy access to all the images on the computer. There are other applications available but one must use a dedicated image organiser. While Windows will allow the viewing of images as thumbnails they are impractical as research tools.

4 Advantages for the individual of document digitalisation

The individual researcher incurs several important advantages with the use of digital photography. The researcher gains convenience, readability and document mobility, the long term costs are minimal, there is the tremendous upswing towards long term research, and the digital images now can be easily distributed among colleagues.

The most important advantage is the continuous availability of the documents. A researcher no longer has to rely on the limited hours of the archives nor on the presence of an archivist. The researcher can conduct archival research from the comfort of his or her home or office at any hour of the day. With the miniaturisation of high capacity hard drives (whether in the form of an external disk drive or an hard drive based device like the Ipod) the documents are now completely mobile and can be viewed on any computer anywhere in the world. I am able to carry my 25,000 images on a portable hard drive, which weighs less than a pound, anywhere. Paper photocopies would be far heavier, bulkier and much less conveniently mobile.

Within the software applications researchers can zoom into an image to read single word or even a single letter. Documents which were previously required a magnifying glass and good eyesight can now be sharpened and enhanced to a point of extreme clarity. This allows the reading of previously illegible scribbles and markings. It allows for the best reproduction of the document and an impressive degree of analysis which was previously impossible.

The document, in its new found digital mobility, is also distributable through digital networks to colleagues and fellow researchers. Important new documents can now be discussed and interpreted by researchers thousands of miles apart. The physical place of the document is now irrelevant to the researcher’s ability to use it. This is apparent in my own work. I am the only historian of Charles X Gustav on the North American continent. I would have had to physically travel to Europe, at great cost, to get second or third opinion on document interpretation and translation. Or I would have been forced to mail a grainy black and white photocopy of questionable image resolution which may end up being unreadable anyway. The usefulness of long distance collaboration depends on the questionable quality of a copy. With digital imagery I can send a high resolution reproduction via email or the internet which will arrive instantly and be of the exact same quality as the document I could have in front of me.

Digital photography also allows me a dramatic savings in long term costs. Instead of living in Stockholm for a year or two while I photocopy and read my was through thousands of pages, I can conduct the research at home. The digitalisation of the archival materials allows me to collect a lifetime of research in a few weeks. While the initial costs are high there is a quick savings in the long term costs. The sheer bulk of money necessary to conduct six months or a year of research was dependent either on personal poverty or the fickleness of the grant process. The costs of housing and eating in an expensive city like Stockholm are phenomenal. Digitalisation saves me not only the bulk costs of living abroad but allows me to keep making money by teaching. It makes me less
dependent on the fickle process of grants and allows me to be an independent academic in a way which was not possible before. I also save my relationships from the stresses of long distances and separation. A year spent 3,000 miles away is year away from family, friends and loved ones. Now I can be reading the letters of Charles X Gustav, in his very own handwriting, concerning the consequences of the Battle of Warsaw and be ready for dinner with the family. Time, distance and money are no longer hindering factors on conducting research abroad.

Lastly, there is the significant benefits to long term research. There is little immediate need for me to return to Stockholm in the near future to conduct research. The 25,000 images represent nearly all the documentary evidence of the Riksarkivet during the time period of my studies. Should I wish to do an article on the letters between the King and Chancellor during the Second Northern War or should I wish to collate a book of the Kings letters while on campaign, I can do both projects without returning to Stockholm to collect additional documents. Having possession of the documents in a digital form will allow me to continue as a scholar of Swedish history when the forces of distance, money and convenience might pull me back towards North American scholarship. In short, I am now able to continue as a long term scholar of a place and time period I might otherwise not be able to pursue.

5 Disadvantages of digitalising archival documents

There are several hindrances towards using digital photography as a universal research method. There is a significant start up cost if you don’t already have the equipment. If one was to start without any equipment at all; the researcher would have to buy a computer with significant speed and memory to handle thousands of detailed photographs, a monitor, the computer’s accessories, a good camera with lens, the camera’s accessories, additional batteries and storage cards, and archival media for the computer. Which can easily run several thousand dollars.

All of this new equipment also lends itself to needing a certain degree of technical proficiency to use it effectively. This may be daunting to the uninitiated since it requires more specialised knowledge in several different areas: computers, cameras, optics, digital storage, networking (for collaboration). By adding a digital component to research, the entire dynamic is changed from diligent reading and pencil based copying to a complicated world of ones and zeros. This may make the use of digital photography more in the area of the young researcher who, like myself, is not yet tied to a specific research method. In fact, the entire enterprise was unorthodox compared to the quiet diligence and reverence of the other researchers (both young and old) at the Riksarkivet.

I do not think the technical problems are daunting. The technology, both in digital cameras and computers, is mature and straightforward. Once the path has been shown and the inexperienced thus initiated, then the use of the technologies looses its magical complexity. I think people’s fear of the digital unknown outweighs the real complexity of the technology.

The third problem is the lack of face to face interaction between colleagues. This significant problem which is only enhanced by the use of digital technology in archival research. While in Stockholm I met with three fellow researchers who were incredibly important to my research. I learned more in a few hours from conversations with them then in a month of reading original documents. Digital technology is isolating
and hinders the personal interactions between people. Having taken 25,000 photographs there is little need for me to return to Sweden in the near future. Unfortunately, I therefore can not meet with fellow researchers in person. Nor can I get a physical sense of the documents. I can not touch them, smell them or get a sense of their weight (physical or metaphysical). The 500 year old letter has become no different than any other digital image on the computer and my discussion with colleagues over the materials is reduced from an interaction of intellectuals into just another electronic correspondence.

While digital technology frees me from the ruinous costs of long term international research it also robs me of that very experience. Just like St. Jerome who went to Bethlehem to complete his translation of the \textit{New Testament} there is something very tangible in being in the place where the events occurred. It is a far more transcendental experience than reading texts off a computer monitor in my university office between office hours.

There is also the complicating factor of manual dexterity. I spent everyday, all day, for three weeks on my feet bent over a camera flipping pages with one hand and fire the camera shutter with the other. Physically, the process is exhausting and monotonous. There is no sense of the documents as an individual piece since they become part of a massive bulk of documents. The simple act of standing for such long periods of time was very difficult and I am a young man in good shape. It was an unforeseen problem which, had I been in different physical condition, might have impeded my research.

6 Conclusion

These are important problems in the use of digital technology which are not easily overcome or ignored. But the advantages of using digital technology in archival research are still many and outweigh the loss of the visceral experience. The information is made mobile and available to me (or anyone else) anywhere in the world at anytime. It allows me to conduct research from the comfort of my university office rather than a drafty (and expensive) rented room with noisy neighbours. Digitalisation of the materials is far more cost effective than massive photocopying and produces are far more readable and flexible product. The short term costs are easily outweighed by long term savings while allowing researchers a depth of scholarship they might not have previously been able to achieve.

The use of digital photography and technology in the archives is a good step if one already has the materials (computer, DSLR camera, semi-wide angle lens) and the technical knowledge of the equipment. Also there is significant benefit to the international researcher, the graduate or post doctorate student who has little time and less money, and if the collaboration between researchers must be conducted over long distances. Finally, digital technology works if one just wishes a more flexible viewing platform for difficult-to-read documents. Taken together there are significant advantages in using digital photography in archival research for a significant breadth of research scholars.