Technology Considerations

Introduction

A successful digitization project must consider the hardware and software needed to capture and manage digital content. The chosen technologies should account for all aspects of capture, preservation, and presentation of the digitized records. The Wisconsin Historical Society does not recommend specific hardware or software but instead suggests you consider the following aspects of hardware and software.

Computers

A computer that balances reliable components with speed and storage is important to the success of any digitization project. Projects that require the purchase of computer hardware should consider the following:

- Purchase a computer that can be dedicated solely to digitization initiatives.
- Purchase as much Random Access Memory (RAM) as your budget allows. Memory allows the computer to more quickly process large amounts of image data.
- Purchase a computer with a processor optimized for image manipulation.
- Purchase as much hard drive space as possible. Portable hard drives that attach via the USB port can be used to supplement the hard drive workspace on the computer(s) being used for digitizing.

Storage

The plan for the storage of digitized files should be considered at the beginning of a digitization project:

- Consult with your organization's IT staff to confirm you will have enough storage space to complete your project.
- Depending on project needs and goals you may need either online or offline storage, or some combination of both.
    - Offline storage: storage of digital data on devices that require human intervention to access (e.g., on backup tapes).
    - Online storage systems: storage of digital data that is accessible and available for immediate use on demand without human intervention.
- Consider how much storage you will need for the current project and possible future projects if necessary. This includes storage of the original document, any copies or thumbnails determined to be necessary, as well as backups.

Monitors/Displays

Monitors give the end-user instant feedback showing text or graphics. For that reason, it is very important to keep your monitor regularly calibrated.

- Liquid crystal display (LCD) monitors tend to be smaller, thinner, and lighter than CRT monitors. They are more energy efficient and take up less space on a desk than the bulkier CRT units. LCD monitor's fixed resolution has been known to lessen adaptability and color rendering; however, they have good image quality.
- Cathode Ray Tube (CRT) monitors render colors of high quality and range. They have more options for handling graphics, so if highly detailed, graphical records are a key part of your project a CRT monitor may be worth the investment for you.

Image Capture Devices

Selection of the image capture device (scanner or camera) is the critical element of a successful digitization project. The correct device for your project depends on numerous factors including:
- Overall project goals
- Format of the object to be scanned

- Size of the object to be scanned
- Condition of materials to be captured
- Available budget
- Litigation requirements for the scan (either current or future)

Several technical factors will also influence your purchase including:
- Cost
- Required expertise needed to operate the device correctly
- Size of scan area
- Speed of the capture device
- Ability to bulk scan many objects at one time
- Connectivity
- Ability to handle different formats and materials

In order to select the correct model with the appropriate features, consider both the objects to be captured and your budget. The nature of the records will impose restrictions and direct your decisions regarding which type of device is used for capture. For example, if the documents are paper contracts, meeting minutes, etc., perhaps a flatbed scanner would be the best option.

- **Flatbed Scanners** are one of the most popular types of scanners. An important consideration when selecting a flatbed scanner is the size of the scan area, a scan area of 11" by 17" is necessary to accommodate a variety of materials. Advantages of flatbed scanners are they:
  - Provide quality scans of two-dimensional objects that fit on the surface of the scanner
  - Require no external studio lighting
  - Generally fit on a table top
  - Can easily be used by someone with only a basic understanding of the digitization process

- **Slide/Film Scanners** are specially designed to digitize slides and film. Although a flatbed scanner with a transparency lid can be used for this purpose, a dedicated film scanner has much higher quality scanning capabilities through higher dynamic tonal ranges and optical resolutions. Optional slide feeders can be purchased which allow batch scans of many slides.

- **Large Format Scanners** are useful for scanning maps, blueprints, architectural drawings, site plans, and posters. They operate like a flatbed scanner but are much larger. Professional grade models come with high optical resolutions; however, they may be cost prohibitive for many projects. Institutions needing to digitize this type of material may want to consider outsourcing to a digital imaging vendor or using a digital camera for image capture (see Digital Cameras below).

- **High-End Book Scanners** allow for overhead copying of bound books and oversized and/or fragile materials that cannot be placed on a flatbed scanner. These scanners are more complex and, consequently, higher priced than flatbed scanners. As with the large format scanners, institutions needing to digitize items from overhead may want to consider using a digital camera for image capture.

- **Wide-format Scanners** were developed to digitize large format materials such as engineering drawings and architectural blueprints. Materials are drawn over the scanning sensor through a pair of drums. Due to the danger of mechanical damage (ripping, tearing), these types of scanners are not recommended for fragile materials.

Image Capture Software

Scanners generally come packaged with the software needed to operate the device. Before purchasing a scanner it is best practice to make sure the software also suits your needs which may include:

- Support for scanning images directly into Photoshop and other image editing applications
- Control over image resolution, bit-depth, and the option to turn on and off automatic adjustment features
- Efficiency and ease of use for the operator
- Production of images in formats appropriate for long-term preservation (not proprietary)
- Support for capture of all unit-determined metadata

OCR Software

Optical Character Recognition (OCR) software works with your scanner to create a text file of words in the document, which allows for full text searching. Using OCR software adds considerable value to your scanning project, because it makes scanned documents easily accessible and searchable once the scanning process has been completed. Be aware that OCR does not work on all types of documents.

Cameras

Just as with scanners, there are many types of cameras suitable for image capturing purposes. For best results combine a camera stand with a 35mm (DSLR) camera or better. Another useful feature is the ability to connect directly to a computer so the image appears onscreen soon after it is captured. This allows for the Quality Control process to be tightly integrated into the workflow and retakes of poor captures to be done almost immediately.

The use of consumer-oriented "point and shoot" cameras and cell phone cameras are not recommended for an image capture project. Lens quality and file size is usually insufficient.

Resources referenced for this document
CDP Digital Imaging Best Practices Working Group. BCR's CDP Digital Imaging Best Practices V.2.0. 2008. http://sustainableheritagenetwork.org/digital-heritage/bcrs-collaborative-digitization-program-digital-imaging-best-practices-version-20 (accessed June 2017).