



**A guide to selecting
the ideal scanner for
your capture needs**

The path to productive document scanning

When you convert paper documents into digital images, you're able to manage them with a point and a click. Most customers who enter into the document imaging world enjoy cost savings and productivity increases. Increased efficiency can also give you a competitive advantage in customer service. But first you have to capture images with a scanner – your on-ramp to document imaging. The goal: paper documents flowing through your capture process quickly and without incident.

This publication will help you start on the path to productive document imaging and assist you in selecting a scanner or scanners ideal for your workflow and volume.

Your imaging chain is as strong as the quality of its links

There's more to the front end (or capture portion) of document imaging than simply running paper through a scanner. Image capture is about making images as legible as possible for humans, as well as for data extraction software. There are multiple factors involved. Let's begin with the basics. Image capture steps typically include:

- **Document preparation** – removing staples, paperclips, sorting by type or condition if necessary.
- **Document transport** – feeding originals, moving them past the camera, and stacking them when done.
- **Imaging** – performed by a camera consisting of a light source, optics, a sensor, and electronics.
- **Image processing** – adjusting exposure, removing skew, removing borders, and image compression.
- **Quality assurance** – checking to make sure scanning and processing are correct and images are satisfactory.
- **Indexing** – creating a database of the imaged documents so they can be retrieved later.

Image quality variables are generally centered on scanning and image processing. However, anything you can do to improve performance at any one of the steps noted here can make your overall business process more efficient. As you weigh your scanner options, it's important to look at how the many combinations of features, speed, and cost impact the process and its output, including reliability and your total cost of operations.

Taking a close look at image quality

Evaluating image quality takes equal parts subjective and objective judgement. Remember, the goal of document imaging is to capture and share information visually. A quick web search about imaging standards by the U.S. and foreign government agencies and educational institutions tells the tale. Consider this from the Inland Revenue Authority of Singapore: "All information contained in the document (be it graphical, textual, handwritten, or otherwise) must be capable of being captured in its entirety and with a level of accuracy that ensures that no information that can reasonably be expected to form part of any subsequent business process is lost or altered in any way." To put it another way, what you get is what you see. The image on the computer screen contains all of the relevant information that appears on the original document. No more, no less.

Putting the scanner to the test

Some imaging qualities can be measured. Engineers can evaluate a scanning system's ability to image areas of a standard test target without distortion or loss of detail. Horizontal and vertical lines should remain straight. Areas of fine details should not fill in. Optical Character Recognition (OCR) performance is another measure. If

error rates are high, it's a sign that the imaging process is deficient.

Assessing scanned image quality

Any scanner design incorporates decisions made by engineers about optical performance and how the raw digital stream of ones and zeros is converted into an image. Because only you can decide if these choices are right for your application, the best way to evaluate a specific scanner is to test it with your documents. Set the capture parameters according to the manufacturer's recommendations for your application. These might be different depending on whether your mix includes photographs, multipart forms, bar codes, handwritten notations, diagrams, color content, or consists mainly of printed forms.

Virtually every scanner is able to scan at multiple resolutions, which are measured in dots per inch (dpi). The higher the number, the more data transferred from the page. But higher resolution can mean a slower scan rate and larger image files per each scanned

The true cost of paper

The average company spends –

- \$20 to file a document
- \$120 to find a misfiled document
- \$220 to reproduce a lost document

Meanwhile, 7.5 percent of all documents get lost, 3 percent get misfiled, and the average professional spends 50 percent of their time looking for information.

Research statistics from the Gartner Group, 2009.

page. You want to achieve the highest speed for the lowest resolution that sufficiently captures the information that's important to you.

Planning for a productive process

When it comes to operational goals for an image capture system, you want the system to do as much of the work as possible. Most importantly, you want to avoid the need to rescan documents and reinsert them into an image workflow. If we look at the different aspects of the imaging chain, it's easy to see that minimizing paper handling is critical.

The right scanner choice will allow you to spend your time on tasks that are more worthwhile than sorting paper. Here are some capabilities to look for:

- A scanner that feeds mixed document types and sizes means you will spend less time presorting.
- A duplex scanner capturing the fronts and backs of documents in a single pass.
- Technology that examines images and auto rotates them to the correct orientation saves on sorting or post-scan editing.

- A scanner that prevents and/or detects overlapping documents saves you the nuisance of removing and rescanning individual documents.
- Detection of photographic content within the batch and on individual documents, and a capture system that can handle a mix of text and images in a single scan.
- Easier preparation for archiving with a scanner that delivers documents face down, in original order, in the output tray.
- Automatically optimized scanning/image quality.
- An image capture system that adjusts exposure (also known as thresholding).
- Automatic handling of "exception" images to limit the need for time-consuming manual rescans.
- Automatic white balance setting to minimize variations between images.
- Color management and color balancing technology to help assure consistent imaging among scanners and between batches.
- Consistent imaging performance to reduce the need to check every image in your quality assurance step.
- Autocropping and straightening of images (deskewing), and deletion of

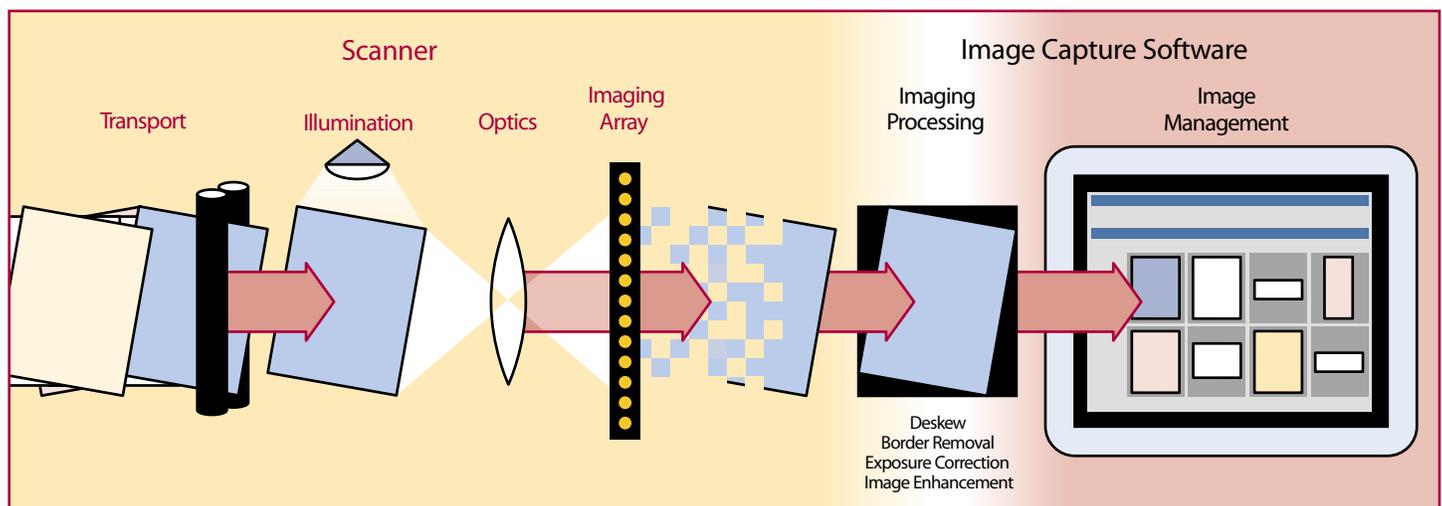
blank pages to virtually eliminate the need for manual imaging editing.

- Background color smoothing for cleaner looking, sharper images with smaller file sizes.

Minimizing operator involvement

By limiting paper handling and automating image processes, your scanning system can minimize the time and labor required to place images into your system. Here are some other important considerations to keep in mind regarding a scanner purchase:

- An easy-to-operate image capture system will reduce the need for specialized training or dedicated operators.
- A capture system that can detect color pages within a batch and can select the imaging mode that best suits the document.
- Depending on your application, you may want the capture system to time-and-date stamp documents, perform indexing by bar code or OCR fields, or perform automatic data entry via OCR. "Trainable" electronic color dropout capabilities handle more colors and variations in colors.



- Simplified routine scanner cleaning and maintenance will enable an operator to safeguard system performance.

Finding the right balance of features to minimize your total cost of ownership

No discussion of quality would be complete without a word or two about cost. There's more to cost than the purchase price of a scanner and imaging software. Be certain you take into account the ongoing expense of labor, consumables such as lamps and feeder modules, service, and software upgrades. Look at any scanner's design in terms of durability and ergonomics. A good guarantee and a strong service contract can also be valuable assets.

A short glossary of scanner terminology

Contrast - the difference between light and dark in an image.

Detail - the ability to discern small features in an image.

Curve optimization - how smoothly rounded characters are displayed.

Edge definition - the difference between data and background.

Illumination - evenness lighting from side to side without bleed through.

Resolution - how many dots per inch the image sensor detects.

Bitonal - black and white imaging.

Grayscale - 16 - 256 steps between black and white.

Color - multiple values of red, green, and blue.

Artifacts - "noise" or stray dots appearing in a scanned image that weren't in the original.



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