

Applying Document and Data Capture Software in the Healthcare Industry

White Paper

By Ralph Gammon – Sponsored by ABBYY USA

Dealing with paperwork more effectively improves patient care and speeds billing cycles

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Executive Summary

It's estimated that \$350 billion or 14% of all healthcare spending in the United States goes toward administrative costs.¹ Related to this, a recent study by PricewaterhouseCoopers, commissioned by the American Hospital Association, found that every hour of patient care creates between 30 minutes to one hour of paperwork.² According to the book *Solving the American Healthcare Crisis*, there has been a 1,500% increase over the past 20 years in the amount of paperwork required to carry out daily tasks in the healthcare industry.

Physician practices, clinics, hospitals and other healthcare providers are clearly investing significant resources on administration and paperwork that could be better invested in patient care. In 2009, in an effort to alleviate some of this burden, the U.S. federal government passed the Health Information Technology for Economic and Clinical Health Act (better known as the HITECH Act), which provided some \$27 billion in financial incentives for the use of electronic healthcare records (EHRs).

And while there is typically a learning curve related to adoption of EHR, a recent survey revealed that 79% of healthcare providers report that their practice functions more efficiently with an EHR system.³ In addition, recent reports are beginning to show that physicians utilizing EHR are able to provide higher quality care than those still using paper records.⁴

But, EHR is not a cure all for paperwork and administration costs in the healthcare industry. A recent survey revealed that almost 80% of organizations with EHR systems admitted to still utilizing paper records. And 78% of the survey respondents believe the Patient Protection and Affordable Care Act (PPACA, aka, Obamacare) will either increase the amount of paperwork they will have to deal with, or, at best, paperwork levels will remain the same.⁵

Two Streams of Paperwork

Paperwork in the healthcare industry falls into two main categories: clinical care documents and business office documents. To help them provide clinical care, providers are dealing with patient charts, admissions forms, encounter forms, lab results, etc. Some of the paperwork collected at the point of care also transfers to the business office to be used in the billing process.

In addition, healthcare business offices have to manage explanation of benefit (EOB) forms from insurance companies and other payers. Increasing levels of deductibles and co-payments also create paperwork related to payments directly from patients. Finally, like any other business, healthcare providers have paper invoices and human resource records.

Dealing with all this paperwork can certainly be expensive. For example, the U.S. Healthcare Index estimates that providers could save more than \$4 per transaction by utilizing electronic claims and payment processing systems, instead of paper.⁶ Studies have shown that electronic invoicing offers similar cost savings.⁷

Related to clinical care, according to HealthcareReports, the average labor cost per bed in a hospital setting for manually retrieving paperwork is \$82.50 per month. This can be reduced to \$.44 with a high-performance EHR system.⁸

With healthcare providers across the board currently being driven to reduce costs and increase the number of patients they are seeing – to help offset the reduced reimbursement rates being offered by insurance companies and federal government programs – document digitization and the efficiencies it offers are more important than ever to the healthcare industry.

Maximizing the Potential of Document Imaging

There is no question that in many people's eyes the ultimate goal in healthcare (and most other industries as well), is to eliminate paperwork altogether. But, as we've all come to learn over the past 20 years, a truly paperless environment is virtually unachievable. Factors such as inertia, a lack of standards among various electronic systems, the cost of converting to electronic systems for smaller entities, and plain old convenience, ensure that the healthcare industry will continue to deal with a large volume of paper for a long time to come.

For example, despite the afore-cited cost savings, the U.S. Healthcare index reported that more than half of the approximately 13 billion healthcare transactions conducted in 2009 involved the exchange of paper.

Document imaging technology represents one avenue for dealing with this paper more effectively, because it enables organizations to manage their paper documents with electronic processes. Of course, scanning a document and creating an image does not magically create an electronic data stream. Information from the image still needs to be extracted and fed into a database, so data-driven systems in areas like billing, EHR, and AP can make sense of the documents.

For example, to index a patient record for retrieval, an EHR system requires at minimum a patient name and MRN or other ID number. To process an invoice for payment, an accounting system needs a vendor name or number, a date, a total, and possibly a PO number.

Efficiently extracting this information can be the key to maximizing value from document imaging. Technologies such as bar codes, auto-classification, and character recognition (OCR/ICR) can be applied to automate data extraction and greatly increase the return on investment (ROI) on document imaging.

Let's take a look at some areas within a healthcare organization where automated data capture can be applied for your benefit.

Opportunities for Automating Capture in Clinical Care

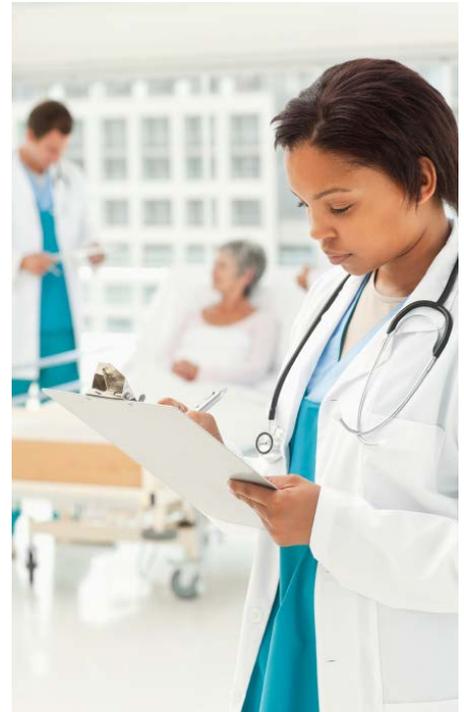
Patient Records

Ever since the passage of HITECH in 2009, there has been an upswell in interest for digitizing paper healthcare records. Patient records, also commonly referred to as "charts," are one of the largest components of an electronic healthcare record. A chart basically contains documents related to a patient's medical history. It can include patient and episodic information, medical orders, lab and test results, progress notes, nurses' notes, discharge information, and legal forms. The number of pages in a chart can vary, but one study estimated an average paper chart contains 75 pages.⁹

An EHR system can typically create electronic versions of many of these records on a day-forward basis. Scanning and digitizing backfiles and integrating them with the EHR system enables providers to have access to a single view of an entire patient history.

When scanning a patient record, there are two major elements that need to be captured for indexing and subsequent retrieval in the EHR system:

- a. **Patient identification:** this can include the patient's name, unique identification number, and birth date – all of which can be cross checked against a database to make sure the correct patient is correctly identified.
- b. **The date of service:** this is typically the only indexing value used to provide information on the type of form an image might represent.





Capturing this indexing data can be accomplished a number of ways including:

- c. Manual data entry
- d. Bar codes
- e. Automated data capture software that incorporates OCR/ICR

Manual data entry requires the least set-up of these methods, but is also probably the least efficient method for capturing data. Bar codes can be set up to automatically assign a record to a specific patient, but this requires a cover sheet is printed for each chart or record – depending on how specific a provider want their indexing information to be. Additional costs, labor, time and change management can discourage providers from creating a comprehensive medical record that encompasses both electronic and paper records.

OCR/ICR technology is typically incorporated in document and data capture software applications that also have features like image processing for improving the quality of scanned documents; forms recognition, to identify the type of form being scanned; and forms processing, which enables the software to identify and capture specific pieces of data.

For a patient record, document and data capture software, such as ABBYY’s FlexiCapture could be set up to automatically capture information like names, dates, and patient ID numbers. The captured information can be checked for accuracy against a database. If there are any discrepancies, or if confidence levels related to what was captured don’t meet a certain threshold, the data can be verified by a human operator. After the capture and verification process is complete, the data is exported as indexing information, along with the image, into provider’s EHR system. The extracted data can also be used to populate fields within other systems.

Automating data capture has been proven to reduce labor by at least 50% in many applications – in healthcare and other industries. In a large backfile conversion, in which several full-time employees can be dedicated to indexing documents, this can produce a significant savings, as well as free up personnel to focus on patient care.

Day Forward Records

For day-forward healthcare records, such as lab results coming in via fax, which are often captured on an ad hoc or one-off basis, it’s often feasible to manually direct an electronic document to a patient’s file. However, even in these situations, automated data capture can be utilized to ensure that a mistake isn’t being made and a record is not being accidentally associated with the wrong patient.

For example, a hospital may have several patients named “John Smith,” in its database. To ensure that a lab result is not being filed under the wrong “John Smith,” the name and birth date on a lab result could be captured by FlexiCapture and checked against the name and birth date of the instance of “John Smith” in the EHR system where the operator is planning to file the document. Ensuring a record is assigned to the correct patient helps reduce the risk of misdiagnosis or other errors that can put a healthcare provider at risk of malpractice.

Full-Text OCR Improves Searchability

What we have described so far is the most basic level of capture for indexing scanned and faxed documents in an EHR system. Depending on their requirements and goals, organizations may want to capture additional information. For example, ABBYY FlexiCapture’s auto-classification capabilities can be used to identify the type of form – making it easier for a physician to retrieve a specific record they are looking for.

Full-text OCR can also be applied through a product such as ABBYY's Recognition Server™. This enables a user to search for a document based on any word it contains. For example, full-text OCR would enable a physician to locate all documents from John Smith's orthopedic specialist, Dr. Jones, by searching on "Jones," under John Smith's records.

Full-text searches across an entire EHR database are also helpful for physicians or researchers looking for documents with common content. Searches on certain terms or diagnoses can help researchers discover trends and similarities among groups of patients. This is helpful for psychologists, for example, doing longitudinal studies.

Achieving Meaningful Use with Advanced Capture

Field-based and full-text OCR can also be used in combination with other technologies, such as drop down menus and database lookups, to help hospitals and physicians' offices capture additional information (aside from basic indexing data) that might be important for inclusion in their EHR system. According to an article published by the *American Health Information Management Association*, "common data and information types that are minimally considered for conversion (from paper files) to EHR include key patient demographic data, a problem list, historical procedures, allergies, current medications, referral sources and follow-up, medical device or implant information (including manufacturer, date, and serial number), immunizations, growth charts for pediatric patients, and legal documents such as advanced directives and custodial agreements."

The AHIMA paper goes on to say, "Methods [for capturing this data] are all labor intensive and require solid data validation and other quality control mechanisms. [Software like FlexiCapture, and techniques like dragging and dropping OCR'd text can be used to reduce this labor]. Practices should limit the amount and type of data converted from existing paper records in order to make optimal use of their resources.... A practice's decision to apply for the Meaningful Use incentives will also affect what information should be converted."

This type of advanced data capture for patient records will likely become more important as the Centers for Medicare and Medicaid Services (CMS) continues to evolve its Meaningful Use requirements for EHR, which are directly tied to physician reimbursements from the federal government.

Patient Encounter Forms

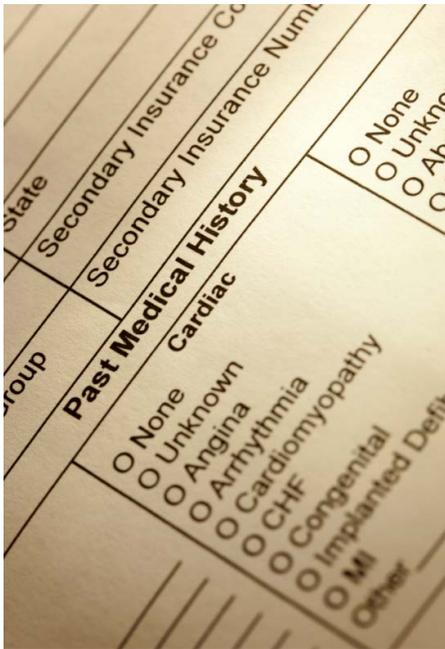
One of the most common forms of documents produced daily in a medical practice is a patient encounter form. An encounter form contains information such as the reason for, and length of, a visit, procedures performed, vital signs, and other data typically needed for both billing and EHR systems.

Most EHR systems offer electronic encounter forms that can be completed on mobile tablets. But many physicians are still more comfortable working with paper. Telling them they will have to enter data electronically can lead to resistance against an EHR implementation.

Automated document and data capture technology can be leveraged to enable doctors to continue to utilize paper encounter forms with a new EHR system. Tests have shown that information from encounter forms can be captured and verified three times as fast utilizing automated data capture software than through straight manual keying of data from the forms.¹⁰

This improved data entry from encounter forms can lead to faster billing. By applying imaging-centric automated data capture, a New York-based oncology hematology lab was able to reduce the average time it takes to bill an insurer from between five and seven days, to 24 hours. Faster billing can improve cash flow of a medical practice, as well as create larger windows for working out any disputes.

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Admissions/Registration

Another form of hard copy document that even practices with EHR systems continue to deal with are insurance cards and patient IDs (such as drivers' licenses) which are typically presented upon admission to a medical facility. OCR-driven capture systems can be used to reduce data entry time from these documents from minutes to seconds – freeing up front desk personnel to be more productive.

Software such as FlexiCapture can be set up to almost completely automate data capture from standardized ID cards such as state drivers' licenses and commonly seen insurance cards. Full-text OCR and drag-and-drop methods can be used to simplify data capture if an exception occurs. The images created for data entry can also be saved to a patient accounting system.

Software can also be used to automate capture of data from intake forms, which typically contain a combination of check box and handprint information. While automating capture of handprint typically requires extensive verification and correction, its accuracy can be improved through techniques like database and dictionary lookups, such as using the U.S. Postal database to verify addresses. Utilizing OMR (optimal mark recognition) for capturing check box data often returns automation rates of close to 100%. In the 2010 U.S. Census, for example, Lockheed Martin reported an OMR accuracy rate of 99.98% on 167 million forms.

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Business Office

EOBs

Paper explanation of benefit (EOB) forms represent one of the biggest data entry challenges that healthcare providers face, and automated data capture software like FlexiCapture can help them overcome it.

The increasing adoption of electronic remittance advices (ERAs) hasn't eliminated the paper EOBs insurance companies send to healthcare providers with their payments. The McKinsey Quarterly recently estimated that the majority of the 2.5 billion claims payments made in the U.S. annually are reimbursed by check and reconciled manually.¹¹ Even providers that receive electronic remittances often don't have the technology to fully ingest them and end up printing out the EOBs for reconciliation.¹²

EOBs can be hundreds of pages long, and each one typically contains information about multiple claims and multiple patients. Each individual claim can have approximately 20 fields that need to be captured. These include the patient name, date of service, physician (service provider), patient account number, subscriber (insured), CPT codes billed, charges at 100%, amount allowed (negotiated rate), amount paid, contractual adjustment amount, and patient responsibility (including co-payments and deductibles).

Effectively processing an EOB is obviously very important to a healthcare provider. The faster they are processed, the sooner the provider can post the payment, follow-up with any discrepancies and file secondary claims. Accuracy is also paramount because EOB data helps the provider determine if they are receiving maximum compensation from their claims.

It's estimated that it takes more than five minutes of manual labor to post a single claim from a paper EOB. As a result, there is often a lag time of anywhere from 10 days to three months from when a provider receives an EOB to when it is posted. (The 10-day period was achieved by a provider using a service bureau to manually process its paper EOBs.)

Automated data capture technology can be used to reduce processing times as well as errors. On the most basic level, OCR-driven forms processing can assist in auto-indexing scanned EOBs to improve retrieval. Leveraging ABBYY's FlexiCapture, AthletiCo, a physical therapy group that operates in the Midwest, was able to drastically reduce the time it was taking to retrieve information from EOB claims. "Locating a paper document could take three or four weeks in the past," says Nick Tsatsis, COO and CFO, AthletiCo. "Now, we're talking seconds. If we can't retrieve the information, we can't get paid."

On a more advanced level, automated capture software like FlexiCapture can be used to extract the majority of important data elements from images of EOBs and post that data to a practice management or other billing system. This type of capture has always been a challenge because of the variable nature of EOBs. Basically, no two EOB forms look the same. Even forms sent by the same insurance company present challenges due to the varying number of lines that can be listed related to a single claim, as well as the varying number and natures of claims on the EOB.

Successfully automating capture from EOBs requires the capture software being used has the ability to understand and parse data from tables. It should also be able to tell where a table begins and ends – even if it is spread over multiple pages.

It's important to note that automating capture from EOBs is not black-box technology. Templates can be set up for a provider's most common EOB formats, but considerable validation and manual intervention is still required. That said, the efficiency gains can be significant. Service bureaus have reported reduction of anywhere between 30-70% of their key entry staff after implementing data capture software for EOBs – with half as many errors being produced, and turnaround times also being cut in half.

In addition to EOBs, healthcare providers are receiving an increasing number of checks and remittances directly from patients, as insurance companies increase their co-pays and deductibles. Automated data capture software can be used to more efficiently extract data and post information from these types of payments as well.

Invoices

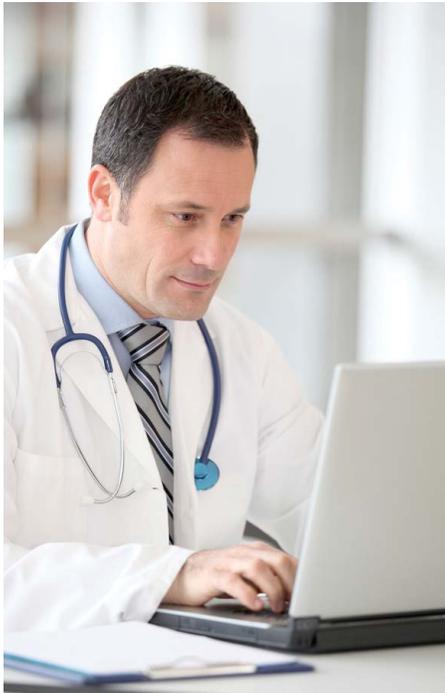
The technology for capturing data from EOBs is similar to the technology used for capturing data from invoices. But, invoices, as they typically involve only a single vendor (as opposed to multiple patients) are much simpler to automate. Automated invoice capture is fairly common across multiple industries, including healthcare.

Software like ABBYY's FlexiCapture can be used to reduce data entry labor related to invoices by approximately 50%. It can also reduce turnaround times, enabling healthcare providers to take better advantage of early pay discounts or avoid late-pay penalties. If PO matching is being done, an invoice can often be captured and posted to a hospital's accounting system with almost no human intervention after the document is scanned. Organizations that use this kind of technology also generally report greater visibility into accruals and exposure.

Other back office areas that healthcare providers can address with automated data capture technology include HR and physician credentialing. In both areas, indexing and other data can be captured for both storage and retrieval purposes and to feed data driven applications. Imaging is helpful in meeting compliance requirements in both areas.

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Conclusion

The bottom line is that there are multiple opportunities for automated data capture within a healthcare organization. In general, document imaging is a technology that often starts in one department, typically the one with the most obvious pain point related to paper. Once the concept is proven to work, it will often spread to other areas, maximizing the initial investment.

At many healthcare organizations, patient records may be the most obvious starting point for implementing data capture software like ABBYY's FlexiCapture, but there are many other areas where it can also be leveraged. These include admissions, accounts payable, and billing. As the name indicates, FlexiCapture is a versatile platform that can be used to automate capture from a wide variety of document types.

Finally, with insurance companies and all levels of government applying constant pressure to drive down what they are reimbursing healthcare providers, it's going to become increasingly important for providers to reduce costs to maintain revenue. Creating more efficient processes through the implementation of technologies like automated document and data capture will help providers reduce their cost per transaction, which will increase their bottom line. It should also make them more efficient, which should enable them to increase the number of patients they see, increasing their top line. Seeing more patients also means more care for more people, which is basically the ultimate goal of everyone involved in the healthcare industry.

About the Author

Ralph Gammon is the editor and publisher of the Document Imaging Report, a semi-monthly newsletter covering business trends on converting paper processes into electronic ones, as well as the popular industry blog Document Imaging Talk. He has been covering and analyzing document capture and automated recognition technologies and implementations since the late 1990s. Ralph has seen automated recognition evolve from a technology in search of a solution to an enabler of a multitude of business process improvements in several vertical and horizontal markets.

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