



STRATEGY

PARTNERS

Innovation in Content Capture and Process Management

Market trends and business opportunities

A Strategic and Practical Roadmap

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This report could be written due to the support of the participating vendors. Each of the vendors is represented with a vendor profile written by Strategy Partners. Strategy Partners acknowledges that not all applicable vendors are represented.

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Strategy Partners Nederland B.V., Willem van Abcoude laan 11, 3971 AA Driebergen, Netherlands.
Tel: (+31) 343.514.882; Fax: (+31) 343.513.177. See also: <http://www.strategy-partners.com> or .nl



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1 Management Summary

Paper documents have for many ages been the most used and easy accessible medium for information communication and storage. To integrate and process paper documents within today's digital information systems and processes scanning technology is used to create a digital image of the document. Scanning technology that over time has developed from very proprietary and hardware based paper to digital image conversion functions to powerful and function rich document capture, recognition and information extraction software. Without scanning there would be no Document Imaging Systems, no digital Work Flow Management, no Digital Archiving and most important no data and information capture for Business Applications.

Document scanning is by no means a stand alone technology market anymore. The market is segmented into different sub segments all with a special usability focus. Segments are Scanning for Archiving, scanning for Process management, scanning for Business Applications, scanning for text recognition, etc. Also the output format has changed from vendors proprietary TIFF to standard PDF/A, from a black and white bitmap file to full colour searchable content with embedded meta data, from large to super compressed encrypted files.

It is the combination of easy to use document scanning functions with powerful document recognition and data extraction capabilities that has made the Content Capture and Processing market one of the most stable and constantly growing software markets within the Document Management industry. It has also delivered great benefits to user organizations. Being able to convert paper to business information and process this directly in Content Management, Business Process management and Business applications (ERP, CRM and finance) delivers great efficiency gains. This by reducing or completely eliminating manual tasks related to sorting, distributing and encoding the documents and the information within.

Benefits that are clearly seen within specific Content Capture and Processing applications like Invoicing processing and the Digital Mailroom. Content Capture and Processing is also a required function for organizations that want to adopt the so called "New way of working". A concept where employees are supported to work at any place, at any time and with full digital access to all relevant business information, also previous paper based information. Content Capture and Processing also integrates paper documents as one of the input flows within Straight Through Processing applications. Automatic document recognition and information extraction delivers the same data input as e-forms on the web filled in by users.

As the office environment becomes more fragmented and document capture moves with it towards remote-offices, business centres or even home-offices. Document scanning is no longer only a high volume central mailroom operation, the Multi Functional Devices becomes important as distributed capture device. Ease of use and the direct integration of the scanned documents into business applications or processes is required to support users who have no daily scanning experience.

This report supports end users who are interested in or looking for Innovative Content Capture and Processing Solutions and want to understand the



technologies behind it, the market dynamics, the most used applications and some of the solution vendors available. A report that not only gives an overview for these different elements but also provides the end user with a set of questions to help him defining a content capture and processing strategy.

Based on this strategy, the important operational elements within it and the relationship with other information systems and processes, the users is supported by a functional checklist to define a possible shortlist of solution vendors that he or she can consult when starting a project. The available solution, key reference accounts and go-to-market information of some of the vendors is described in chapter 10.

This report doesn't provide a in-depth technical or functional analysis and ranking of the different vendors, nor does it describe all available solutions on the market. It is a first attempt to describe the technology, the market, the applications and to guide the users to a better understanding and use of the available solutions. This to benefit from Innovative Content Capture and Processing solutions in the same way as many users are already doing today.



2 Introduction

How to effectively innovate in (often distributed) Content Capture and Processing solutions is for many organizations a question, which remains difficult to answer. Technology is seldom the critical factor. A successful implementation involves specifically IT (as owner of the software, hardware and infrastructure) and Facility Management managers (as owner of the mailroom). Organizational parts that often not work closely together.

Content Capture and Processing solutions are based on the ability to create digital images of document and extract data from them, to support highly efficient digital processes and architecture for the handling, processing and distribution of incoming and outgoing mail pieces. Sending document in physical form through the organization is often the cause for all sorts of problems. The most obvious one is losing the piece of paper or that it remains on someone's desk because the person is ill or on holiday. This will result in a stop of the specific transaction. The whole business process will stop and will have most likely an unhappy customer.

Strategy Partners has written this report based on its many years of experience to help organizations to take the next step in document based processing and communication. What innovative approaches are available, how to value and select them and how to implement those in the organization.

The words in the title itself can be explained further using a dictionary.

- **Innovation** Introduction of something new, incremental, radical or revolutionary changes.
- **Content Capture** Select the relevant scanned data and turn this data into a portable digital format.
- **Processing** Transport the captured data to the relevant ERP, Admin, or business system and finally store it for archival purposes.

When we "translate" the title with the explanations given it becomes:

"The exchange of written and printed evidence in a new digital and exchangeable – process able and retrievable format."

Based on this translation the context becomes much clearer. This report will describe new ways in how printed or written documents (fax, invoice, statement, policies, letters etc.) as well digital content can be converted into intelligent data, which can be handled through a chain of activities(the process) into your business system with a minimal (No) manual intervention.

" **Solutions supporting scanning, capturing, classifying and processing of printed and digital** data help companies convert paper-intensive processes into digital workflows for efficient, electronic distribution, inbound to the company business system, outbound to the customers supplier business system"

Capturing paper documents into digital form has traditionally been a centralized business function. In contrast, "distributed capture" is a strategy for entering documents into the business process at decentralized locations rather than



shipping them to a central location for scanning. For organizations with a great diversity of paper documents which are generated in multiple locations, the decentralized scanning, capturing and indexing functions saves on mail and courier expense, speeds-up data input, and expedites the processing of critical business documents.

What is so important regarding scanning, capturing and processing solutions, to invest in these new innovative solutions? The reasons can be diverse. For most organizations document based communication, archiving and processing is usually a manual or partly manual process. Respondents indicated in our survey that they could save 40 % on the general administration costs and 59% on the financial processes by implementing innovative scanning, capturing and processing solutions successfully.

Document-based information often enters a company in a multitude of ways; by mail, courier, fax, e-mail, either digital or paper formats. The various processes used to manage this information are often de-centralized. This makes it difficult for employees to access and exchange the knowledge-assets buried in company files, on individual computers and networks. Imagine all those processes compiled into one centrally organized and managed system where information can be simultaneously directed to multiple destinations regardless the format. The capturing and process solutions capture, convert, recognize, classify and move information from one format to another, from one location to any other, efficiently and cost-effectively.

The goal is to increase the efficiency of business-critical document workflows, as well reducing the time; cost and hassle of capturing, managing and securing documents with fast, efficient document capture solutions. No matter how big or small the work environment, these solutions give the business total control. The hardware to enable these solutions are multifunction devices, dedicated document scanners and more often new electronic media devices like a mobile phone.

Other reasons which are sometimes not directly related to the business goals are also valid recommendations:

- Compliance and integrity regulations as imposed by governmental organizations
- Customers force you to connect to their workflow
- New investments in hardware (MFD's) gives you the option to invest in a document management system (automating the doc. management workflow)

All are valid reasons for investing. Probably the number one is still cost saving and being ahead of the competition.

The global competition, competitive pressure, time to market all have their effect on how organizations will set up their document management process in order to be as efficient as possible and reduce significantly the labor steps and costs.

Open technology standards, as well as the connectivity between business systems (ERP, CRM or Admin systems) supported the increasing use of scanning, capturing and processing solutions. One of the reasons many ERP suppliers offers part of the processing workflow and or connectors to processing/workflow solutions suppliers, enabling a fluent workflow of capturing, processing and archiving.



This market report will identify the necessary steps, which need to be followed to enable a successful deployment in innovative scanning, capturing and processing management. Some of the relevant issues are:

- What are the research activities the organization needs to do
- What are the decisions that need to be taken
- What are the advantages that could be achieved
- What are the techniques available in the market
- What are the experiences of the “early adopters”?

To all these questions, this report will try to provide an answer. So it becomes possible for the organization (the reader) to identify and describe a strategy in automated document scanning, capturing and processing management. A realistic strategy, aligned with the business goals.

To support the writing of a strategy that is realistic and deployable, a set of key vendors with their products and business solutions will be described. These vendors are selected because of their innovative approach in this market segment and their willingness to participate in the costs of writing this market report. Making the right choice of a vendor is crucial for the success of the strategy deployment. Many projects have failed because the chosen vendor was not able to deliver on their (marketing) promises. An important goal of this report is the support it gives the reader to create a shortlist of vendors who can deliver on the strategy and selected innovations. At the end of this report selection matrices are presented as a help to create a vendor short-list. The selection matrices can be easily used when the questions in the first chapters of this document are answered before doing the selection. The 2 or 3 vendors who come out best in the selection matrices are well equipped to handle the requirements of the organization.

This report is specifically written for the European market. It contains the trends, experiences, approach and (key) vendors for this market. This makes the report extremely practical and useful. We, as Strategy Partners, hope it will help your organization to shorten the timeframe drastically in the strategy writing, preparation, architecture decisions, proposal writing and handling and the deployment.



3 History and origin of Scanning and Distributed Capture

With the introduction of Internet-based capture, several years ago, more and more organizations are realizing the benefits of scanning documents at the touch point with their organization instead of shipping documents to a central scanning center. In this way they are assigning indexing tasks to knowledge workers who today often work from home. But just how prevalent has distributed capture become? What are factors leading organizations to adopt distributed capture? What are the returns that organizations have been able to measure?

The notion of distributed capture is not necessarily a new concept; however, many new tools and techniques have recently emerged to compel organizations to take a closer look at the benefits. Early approaches utilized fax networks to send documents from regional locations to a main hub for processing. Once scanners became more prevalent in the market, companies began to utilize wide area networks (WANs) and Local Area Networks (LANs) to transport documents. Both of these methods are still used today, but as the Internet has become a pervasive infrastructure, the majority of organizations look to the World Wide Web as the preferred method of supporting distributed capture capabilities. As a result, the combination of technology advancements, the unyielding burden of paper documents, and significant cost savings available has done much to advance the proliferation of distributed capture systems.

To give a good understanding about the developments of scanning, distributed capture and processing the background of scanning, distributed capture and processing is explained.

The first image scanner was manufactured under the leadership of Russel Kirsch. This drum scanner was built at the National Bureau of Standards in United States. The scanner was developed in the year 1957, and the first image to be scanned was that of Russel Kirsch's son, Walden. The image was 176 pixels, in terms of resolution, and had a size of 5 square cm. It was a defining moment in the history of the development of image scanners.

In these early days scanners (based on fax technology) proved to be useful in preserving paper documents as photographic films. The functioning of these models can be described as follows. A scanning drum produced analog AM signals that were sent through the telephone lines and detected by receptors. These receptors then printed the image on a specially prepared paper in accordance with the signals received. This technique of imaging was already used by the newspapers for a period of around 70 years between the 1920s and 1990s.



The SEAC Scanner
with control console in background

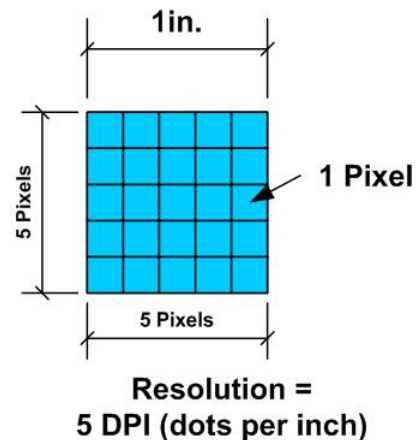
The first generation scanners were primarily used for photo scanning, however the later versions (1980) were also used for scanning documents.



A first step in the development of a new and innovative Content Capture and Processing solution is the inventory of the current equipment (scanners) used and its specifications. A crucial element of the inventory is to highlight the proprietary elements of the equipment. For example, a specific interface with the PC, dedicated software or cables required.

Resolution is the definition of the finest details which a scanner can see. The scanner needs to be able to resolve the difference between very close together image elements as black or white spots. Some scanners can see details smaller than the size of a pixel. This is called "aliasing" or "false resolution. That can lead to a wrong interpretation of the text on the image.

Many people and manufacturers erroneously use the term "resolution" when they really are referring to the image structure, or the number of pixels in an image. With above information about scanning, the importance of scanning, quality, DPI, resolution and file formats is highlighted.



A second step in the development of the Content Capture and Processing solution, with regard to the quality of scanning needed.

- What type of document will be scanned? (Plain text, documents with photos, etc.)
- What will be done with the images in the processing? Just manual interaction or machine interaction?
- Is resolution is required to support automated classification of documents?
- Is black and white scanning enough or should it be in gray-scale or color?



Distributed capturing solutions provide the ability to establish an efficient document management system across various offices and locations whether throughout various floors of a building or across the world. As a result, organizations can shorten transaction processing time, cut costs in shipping and mailing, and open up new opportunities for increased productivity. Paper-intensive organizations such as transportation firms, banks, insurance companies, and mortgage brokers were early adopters of distributed capture. Today companies in all verticals and of all sizes find that distributed scanning can help them save time and money,

reduce errors, and increase efficiency. As companies become more widely dispersed in their "new way of working" with regional offices, remote employees, and geographically distant customers, distributed capture surfaces as an important tool to easy and facilitate the processing of mission critical information.

The automated processing of documents in an enterprise/office environment is still developing. The earliest software products/solutions date back to as early as 1980. These first implementations were very technical and where just created to scan document with a proprietary standalone scan station. Over the years functionality was added for connectivity with computer stations, and Optical



Character Recognition (OCR), error recovery, data transformation, workflow management, and archiving.

The last years have shown a change from the proprietary environment to a more open architecture with connection and communication standards. With the developments in the Scan File and Archiving market, organizations started to develop new applications to optimize and automate this process of scanning, workflow and archiving. Specifically with the development of the Multi-Functional Devices (MFD's) that combine the functionality of print, scan e-mail, fax and workflow, scanning at the desk became very popular.

These trends gave IT, the office and the mailroom a new challenge in the day-to-day operations. The responsibility is changing from a pure manual mailroom and distribution center to a center for the accurate delivery of constantly changing mail and document pieces (paper, electronic, secure, digitally signed, etc) to an automated document-distribution environment.

The third step is the inventory of where papers (documents) enter and leave the organization and where they are needed.

- Which locations need to be taken into account?
- How these locations currently are connected? (At the IT level)
- What are the current distribution mechanisms for paper documents?
- What are the issues faced in today's business processes with the paper handling?

The various vendors in the *Content Capture and Processing* space have a multitude of answers to overcome the mentioned challenges. One of the frequently used solutions is the innovative capture, indexing or classification, and validation of the information needed by an enterprise. The initial scanning solutions (20 years ago) where stand alone, with no or limited OCR functionality. It was too complex to connect with ERP or MIS systems with indexing and archiving functionality. The current functionality and solutions focuses more on *business process management, process automation, automated classification and routing, secure delivery and management information*. When implementing the functionality enhancements, the process improvement would be significant and the savings could reach an 80% of the current manual handling cost.

When looking at the European market the number of implementations that have all off the above mentioned functionality they are still limited. Often the mail and document handling is still done partially manually, applications are not integrated and there is no strategy for a new approach. Reasons for this are to be found in issues like unawareness of the possibilities with new products, no priority, no budget or split of responsibilities.

In the following chapters of this report we will discuss in more detail the translation of the business goals into document capture and processing processes based on scanning, recognition and classification techniques. We will not go too much into the detail of the technique, features and functions of the software itself. Instead the development of an Content Capture and Processing strategy will be emphasized; a strategy that is based on the existing infrastructure and has a goal of bringing the necessary innovation



4 Innovation in Content Capture and Process Management

This chapter will describe several technology trends and market developments in relation to document scanning, capturing and processing. This information is then used to describe four innovative solutions areas in document scanning, capturing and processing.

These four solutions areas are:

1. PDF as a scanning and archival standard
2. Recognition and classification off documents
3. The digital mailroom – incoming and outgoing
4. Scanning aligned with the business process

All of the proposed innovative solutions can be implemented today using existing technology. No new technology development is needed. By using the pre-condition checklists and following the steps for the implementation process, an organization (project team) has a practical guideline.

4.1 Technology Trends in Scanning and Capture

The market of document Capturing and Processing is still rather young. When looking at the establishment dates of most software vendors, many have a history between the 5 and 20 years. As mentioned in the previous chapter, this market started with the need to optimize document handling and get document based data more accessible and available.

In the content capture market different vendor types are recognized. Each of the vendors with a different product background and a go-to-market approach. The vendors offer their scanning, data capturing and processing solutions via direct and indirect sales channels. Direct means via their own offices and indirect means via a reselling channel, system integrator or OEM partners. Often the more advanced and complex applications will be offered direct.

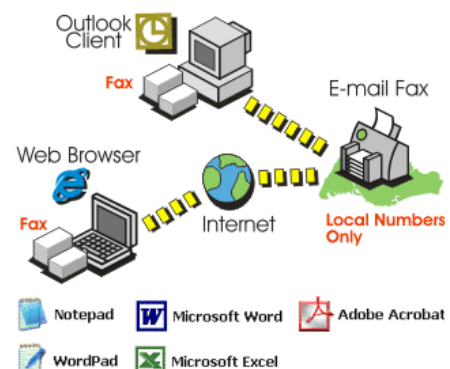
Technology trends around scanning, capturing and processing.

Image capture software has matured from a simple paper to image file conversion function to included advanced image correction, clean-up and enhancement functions. While the capture functions itself are very mature the development is focused on image file compression and the integration with additional processing features and functions to deliver one integrated image and information capture solution.

Some of the additional functions are described below.

- **Fax Processing**- Faxing (remote document scanning or delivery) is still an important (legal and required) communication platform. Every business (small, medium and large) has one or multiple fax machines, while not every business has the ability to scan documents. As a core technology, fax is still the simplest point-to-point technology that is viewed as "secure". This especially in verticals markets like financial services, government and medical.

It is safe to say faxing will be around for quite a





while, and companies need a better way to deal with processing inbound faxes. Just having a fax server is not enough. Organizations need to look for ways to intelligently process faxes, and route them into workflows and repositories.

The trend in fax processing is not to have a fax machine that produces an actual piece of paper, but a fax server which handles multiple incoming numbers and routes the incoming fax document to a specific e-mail inbox. An alternative to enhance the fax server is to extend the functionality with document recognition and classification. The plain image is then not just routed to the e-mail inbox, but also the meta-data. Allowing for automated processing and handling.

- **2D Bar-coding** - Tying in with the overall theme of automation, and the reduction of labor based processing, 2D barcodes are the good technology to incorporate preset data into documents. Take for example the HR intake documents that need to be signed and filed digitally. Encoded in the 2D barcode is the employee ID, the type of document, and any other required data that needs to be collected upon scanning. One of the most common used innovative barcodes is currently the Datamatrix barcode. This tiny barcode can contain lots of information and has a recovery mechanism where data can still be read when parts of the barcode are damaged. Another new technology is the "IntelliStamp". This barcode is generated using the content of the page. Relevant information is incorporated in the barcode. Making it nearly impossible to create a fake or altered copy of the document in which the relevant information is changed.



- **Migrating images to a DMS** - About every company has documents on the network that are received by mail or scanned by a MFD or scanner. When implementing an ECM/DMS system, the challenge becomes the migration of these documents and their metadata into the new repository. Document harvesting tools provide the ability to automatically grind through a network folder structure, gathering folder info, file naming schemes and document data, with the goal of moving the images. Often they provide OCR functions to populating index fields/columns.

- **Scanning to the Cloud**- More and more organizations realize the benefit from solutions that they can use in their office or remote location, without having to worry about the IT and maintenance issues. Cloud based solutions for capturing are stored on a central server; the customer is using it via the web. The client interface is the browser, the server for processing can be anywhere on the world. The vendor is managing the software support, maintenance and updates. The licensing is usually SaaS based, (Software as a Service). Software is rented, instead of bought. This is usually cheaper and more efficient from an overall TCO (Total Cost of Ownership) perspective.



- **Security** - Often business and IT managers shudder at the thought of how often confidential information has been exposed on physical and digital documents. Therefore organizations are looking at ways to protect confidential information through encryption. Encryption that has to be done at the moment of document being captured. Also hard drives of MFD's contain lots of critical information. All





information which is scanned or printed is stored on the HD of the MFD. Therefore these MFD's and their hard drives must be encrypted too or cleaned on a user and daily bases. Having solutions that can parse text document and obscure matching patterns of scans, Tax ID's, as well as protects the HD of the printers has become an absolute requirement in today's world.

- **Metadata Output – Data Quality management** – Overall process efficiency can be achieved by gathering information at the source and verifying and correcting it before sending it into the organization for further use. If the capture process already collects new customer information, why not use this data to update the ECM, the CRM and the financial and reporting repositories all in one step? Documents often contain critical information for business operations. With the focus on organization wide Master Data management organizations are looking at ways to reuse and share collected data, and utilizing advanced capture as an all in one data collection solution. This to reduce error correction afterwards and to provide high quality information to users and costumers.
- **MFD's** and their use have evolved significantly during the past 5 years. Integrated copiers, faxes, and digital senders provide great onramp possibilities for any back end system, and allowed organizations to finally leverage their investment in these devices. With advanced capturing and processing solutions, a integrated collaboration and document processing platform becomes available. In chapter 7 the role of the MFD is explained in more detail.

The trends as highlighted in this paragraph are a short compilation of the issues or demands from the organizations Strategy Partners has interviews during the research process. Most of the trends as discussed can be implemented by existing products. Not all vendors support the functionalities as discussed here. To help in the search for the right solution which can be used to implemented; the second part of this document discusses several vendors who can offer the required functionality.

Which of the trends as described also have an influence on the innovation in content Capture and Processing for the organization?

- Is faxing still an important technology used in the organization to exchange documents? Done through a fax server or with traditional fax machines.
- To what extend can barcodes be used on outgoing documents to enhance the return processing of these documents?
- Is there a tight integration needed with a Document Management or archive system?
- Is doing everything yourself the obvious way or are alternatives like outsourcing or using cloud based solutions an opportunity?
- What type of documents is processed and what type of security is needed?
- Can meta-data be extracted automatically from the documents?
- Are the Multi-Function Devices used to its full extend?



4.2 Market Sizing and segmentation of Content Capture

The document capture software market is an integrated part of the overall Document Management market. Over the years the market has developed from software for pure paper to image file conversion (scanning only) towards advanced document recognition and information extraction services for lines of business applications.

The global market for Document solutions grew in 2009 by 2.3% to € 1.95bn. It is expected that the market will reach 3,2 billion in 2013. The capture software segment of this market is close to 14%.

"Despite some very challenging economic conditions, the overall capture market grew as it changes and matures."

Strategy Partners identifies six different document and information capture software market segments. They are:

- - Document capture for Archiving
- - Document capture for Business Processes
- - Intelligent Document Recognition for Data extraction
- - Templated Forms Processing
- - Imaging for Text collection
- - Capture toolkit components

Each market has different vendors with different basic technology components and therewith associated features and functions. Even today there is not a single one size fit them all product. Users should examine the requirements and the desired outcome of their target application and be aware of the different solution capabilities before selecting the final software package.

It are the submarkets Document capture for Business Processes and Intelligent Document Recognition that are showing significant year on year growth. Also the capture toolkit market shows good growth because the tools are much easier to use and many vertical market focused application vendors are integrating document capture and information extraction functions in their core applications. On a high level these submarkets can be grouped in two main areas:

- **Ad-Hoc Imaging and Batch Imaging** – the on-demand conversion of individual paper documents or batched documents into indexed images. This market segment declined by 1.9%. The major reduction was in Ad-Hoc capture, which declined by over 4%, whereas batch capture showed a small increase. This market was negatively affected by reductions in sales to consumers, in printer sales, and in upgrades of small boxed solutions, and by the fact that much of the large batch back file conversions in the developed countries have now been completed.
- **Ad-Hoc Transaction (in-process) and Batch Transaction** - typically for capture and extraction of the data from document to support business transactions. This market segment grew by 7.1%. This market is driven by the need to faster understand and process incoming business documents. This as close to the point of entry into the organization as possible.

Capture technology is primarily used in market segments that rely on intensive document exchange and communication.

Figure 1 shows the adaptation of capture solutions within the different market segments.

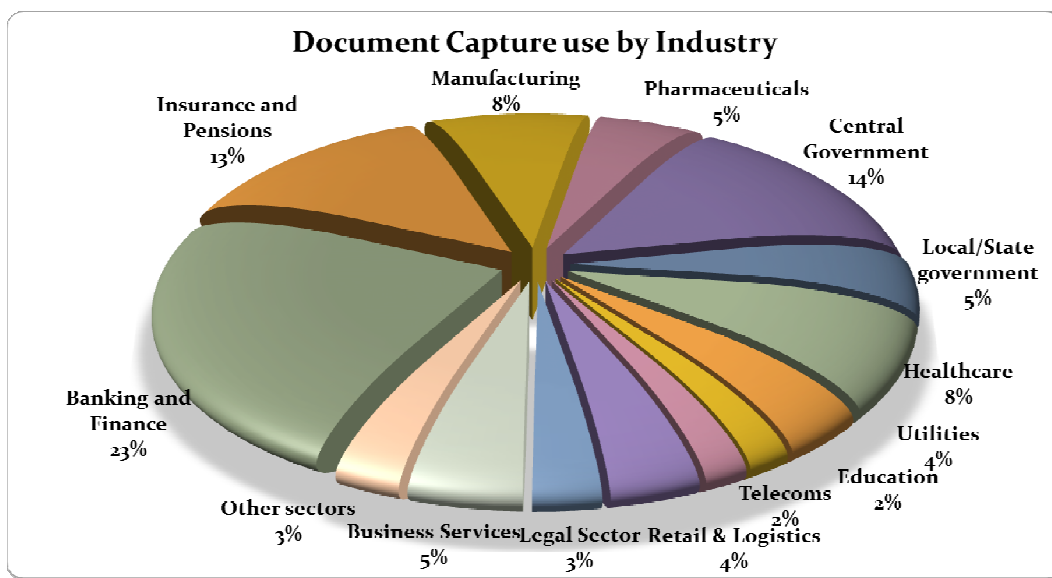


Figure 1 - Document capture use by industry segment

Capture has evolved from a simple departmental based paper to image file scanning solution to an intelligent data gathering service. End user organizations are realizing that many of the business transactions that enter the company in various ways, such as regular mail, fax and even email containing images, can be processed automatically. Previously these images required expensive manual processing or have been ignored except for archive purposes. Using a variety of pattern recognition technologies, capture is starting to be employed to cover a much wider range of inputs. Intelligent classification software and business rules can start the processing of incoming business documents in a similar that of a trained human clerk. This expands capture into business process entry, understanding and processing incoming electronic and paper documents, with little or no human intervention.

As a result of this use an entire transaction process can be automated regardless of information being received as an electronic transaction or as paper or fax.

In 2009-2010 Strategy Partners started to see an significant up-take in Enterprise Capture solutions. Customers are implementing capture as a more generic service layer within their IT-infrastructure. This as part of a overall document and information capture strategy that has a higher value add. As a result of this development Strategy Partners continue to see more individual sales that are over €185,000 each and a few worth of several million Euro's, as companies recognize compelling paybacks and ROI.



Which type of market segment does the organization operate in?

- | | | |
|----------------------|------------------------------|-----------------------------|
| • Ad-hoc imaging | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| • Batch Imaging | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| • Ad-hoc transaction | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| • Batch Transaction | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

The next chapters will describe several solution or attention areas in relation to document capture and processing.



4.3 PDF/A as a scanning and archiving format

PDF/A is becoming the standard as a format for long-term archival. Where TIFF was the format of choice during the last years, PDF/A is now taking over due to the fact that PDF/A is an official ISO standard. TIFF has never become such a standard with the effect that vendors can apply their own extensions to the TIFF format. These with the effect that there is no absolute guarantee that a document stored in TIFF format can be read by any TIFF compliant reader.



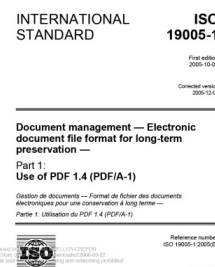
With PDF/A such a guarantee can be given. The development during the last 2 years of PDF/A as a ISO standard has a major impact on the scanning and image processing platform. Scanning in PDF/A or the conversion of TIFF files to PDF/A becomes a very relevant technology.

The main goals of the PDF/A standard are:

- Maintain static visual representation of documents
- Consistent handling of Metadata
- Option to maintain structure and semantic meaning of content
- Transparency to guarantee access
- Limit number of restrictions

PDF/A is a file format for the long-term archiving of electronic documents. It is based on the PDF Reference Version 1.4 from Adobe Systems Inc (implemented in Adobe Acrobat 5 and latest versions) and is defined by ISO 19005-1:2005.

The ISO Standard does not define an archiving strategy or the goals of an archiving system. It identifies a "profile" for electronic documents that ensures the documents can be reproduced in the exact same way for years to come. A key element to this reproducibility is the requirement for PDF/A documents to be 100% self-contained. All of the information necessary for displaying the document in the same manner every time is embedded in the file. This includes, but is not limited to, all content (text, raster images and vector graphics), fonts, and color information.



Guidelines and key elements to PDF/compatibility include:

- Audio and video content are forbidden.
- JavaScript and executable file launches are forbidden.
- All fonts must be embedded and also must be legally embeddable for unlimited, universal rendering. This also applies to the so-called PostScript standard fonts such as Times or Helvetica.
- Color spaces specified in a device-independent manner.
- Encryption is not allowed.
- Use of standards-based metadata is mandated.

Recent trends and future expectation of PDF/A

The PDF/A standard and technologies around it are constantly developing further. The following trends and developments can be expected in the upcoming year(s).



- JPEG2000 image compression: The inclusion of the high performance compression process JPEG2000 is interesting for scanned documents, because of the better quality that is offered compared to the older JPEG format. JPEG2000 also offers a lossless compression level.
- PDF/A-2 standard which is expected to be published in early 2011. PDF/A-1 is based on PDF version 1.4. PDF/A-2, which is based on the independent ISO standard 32000-1, can use functions which were only available as of PDF version 1.7.
- PDF compression, with full functionalities to PDF/A standard
- Enterprise process and control functionalities for PDF compression workflows
- Incorporate advanced OCR technologies - to include a text version of the converted image file format.
- Add Classification and form data extraction - to add meta-data to the converted image file format
- Collections of embedded PDF/A files are called "portfolios" in Adobe Acrobat.
This function enables users to compile multiple files in a "PDF container". PDF/A-2 now allows PDF/A collections to be created from a number of PDF/A files. File formats different than PDF/A are explicitly not permitted in these collections. An example is e-mail archiving including the attachments in a PDF/A collection.

Advantages of PDF/A workflow

When document are archived electronically this has many advantages over traditional paper or microfilm formats. Improved accessibility alone may substantiate the implementation of an electronic archive. Some advantages of a PDF/A archive over a TIFF or a paper-based archive are:

- **Full-Text Search**
PDF/A stores objects (e.g. text, graphics), allowing for an efficient full-text search in an entire archive. TIFF is a raster (bitmap) format and must first be scanned with an OCR (optical character recognition) engine.
- **File Size**
PDF/A files require only a fraction of the storage space of original or TIFF files, without loss of quality. The smaller file size is especially advantageous by electronic file transfers (FTP to remote locations, e-mail attachment, mobile phone use, etc.).
- **Optimization**
PDF/A format can be optimized. The optimization can be focused on images (e.g. scanned checks) or extracting structured data (e.g. voucher information). TIFF treats all file information the same.
- **Metadata**
Metadata like title, author, creation date, modification date, subject, keywords, etc. can be stored in a PDF/A file. PDF/A files can be automatically classified based on the metadata, without requiring human intervention.
- **Digital signatures**
The PDF/A-1 standard already enables the use of electronic signatures. In PDF/A-2, signatures are integrated and used according to the PadES standard published by the European Telecommunications Standards Institute.

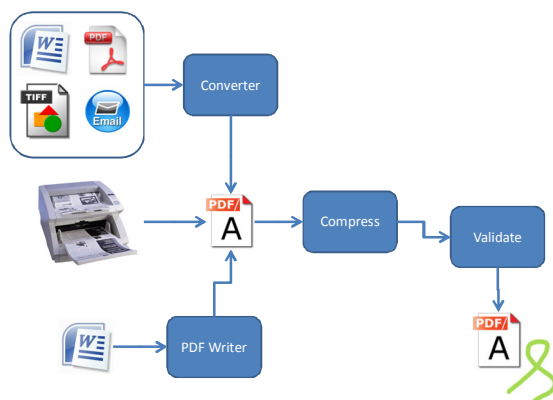


Figure 2 - PDF/A converter and validation workflow

Two specific highlighted functions of PDF/A as part of a scanning and archival solution are the “scan-control-store process” and the “document archival strategy”.

Scan-Control-Store process

PDF/A is not only a document archival standard. PDF/A can be used as the organizational standard for internal and external communication to comply with various regulations for reproducibility, tracking and tracing and electronic delivery. To achieve that, there is much more to organize. The process starts already at the source or origin of the document. Scanning documents in TIFF format makes it difficult to organize a final storage format in PDF/A.

The innovation starts with the scanning in PDF/A format, converting other electronic formats to PDF/A and converting the “old” data storage to PDF/A. However a pure conversion process is not sufficient. A control process must be part of the process where the generated PDF/A document is checked for compliancy against the ISO standards. Where one product from one vendor can do the conversion, another product from another vendor will do the control. Within the processing the correct meta-data must be set and incorporated, full-text search must be possible as well as the verification of the source or owner. This all requires a solid solution architecture and well defined control process.

Document archival strategy

Scanning and the sub sequential archiving of documents in PDF/A format requires a document archival strategy. As described in the previous paragraph, just converting is not the solution. From a technology perspective several choices have to be made. What will the actual PDF/A level be in which the documents are archived. Is there a need for PDF/A-1 or PDF/A-2. Should it be version 1 or version 2. What control mechanisms are in place to check the PDF conversion tools.

Apart from the technology decisions several business decisions need to be made. Not every document is eligible for a perfect conversion to the PDF/A format. What needs to be done with documents that cannot yet be converted? What to do with hyperlinks, dynamic documents or documents with objects inserted. Which documents need to be converted, what is the retention policy, is the PDF/A conversion done after the business process activities or in the beginning?



A successful “scanning and archiving in PDF/A format” solution can be deployed when the following recommendations are taken into account.

Preconditions

- What types of documents are used during the business processes? Images, PDF's, Word, Excel, etc.
- Which of these documents needs to be archived for long term storage?
- What volumes of documents are entering the organization? Specifically in paper format.
- What are the legal conditions for the incoming and outgoing conditions?
- What are the archival needs? How many years the documents need to be stored?
- What are the requirements in viewing the archived documents? Should it be an exact replication, or can it a near replication?
- Is the scanning software supporting the PDF/A format?
- Is there a requirement for meta-data, electronic signature or full-text search?

Implementation process

- Describe the process flow for the incoming documents, the business actions and the storage.
- Describe the legal and records management requirements for archiving.
- Create an inventory of all formats that need to be scanned and/or converted.
- Select the needed software tools.
- Prepare the technical deployment. Don't underestimate this action. The connection and integration between the scanner(s), fax, e-mail and archival servers can be complex and causing a lot of issues.
- Develop (configure) the application (workflow) that handles the business rules.
- Testing and deployment
- Evaluation

The innovation in scanning and archiving in PDF/A format is not just the conversion of TIFF images or any other electronic format to a PDF/A format. Implementing a PDF/A process from scanning up to archival requires a business strategy and the usage of relevant tools and techniques to comply with the regulations. The true innovation comes from the process where in the end PDF/A files are managed and archived for which the process and the tools can guarantee that the file is a PDF/A file according to the ISO standards.



4.4 Recognition and classification of documents.

The conversion of paper documents to image documents isn't the innovation anymore. Interpreting the image document and extracting meta-data in an unstructured manner and classifying the type of document is a highly innovative solution. The classification of documents based on the content, words used, linguistics and neuro-linguistic processes is just at the beginning of the technology cycle. In the recent past highly paid employees were needed to read the incoming document and decide what the next step of processing would be. Replacing these employees with an automated recognition and classification solution can be very beneficial.

Organizations that have many or a great diversity of incoming paper documents are eligible for an automated capture system. This to enhance their business processes. Figure 3 shows a workflow of a typical recognition and classification process.

Any paper document — being it purchase orders, insurance claims, expense reports or invoices — can be put through the capture, document classification and data recognition processes in order to extract the needed meta-data and classify the document type.

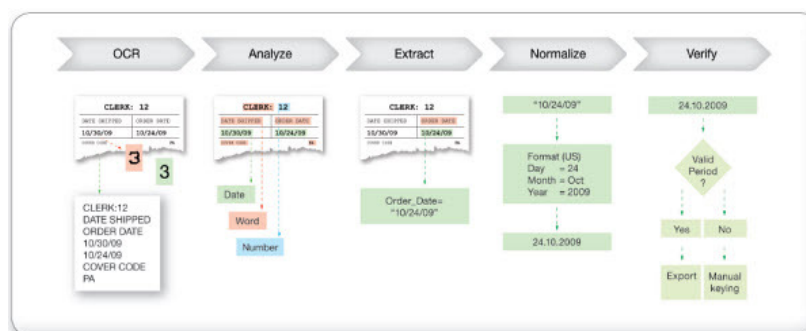


Figure 3 - Recognition and classification process

The capture process starts in the (digital) mailroom, at the point of entry of documents into the organization. No manual data entry (thus, fewer errors) could be one of the biggest advantages of using an automated system. Next step is to use the extracted data and launch a business process – a payment of invoice, for example. Records retention and archiving functions follow, supported by distributed capture-recognition and processing solutions and via integrations with other applications such as SAP, Oracle and Microsoft Dynamics.

In Figure 3 the process flow of scanning and OCR/ICR technologies is explained. Without a high quality scan, the paper/printed documents cannot be recognized properly. The process of data recognition is a multi-step process. Document recognition traditionally starts with document classification to determine the type of document. Second step is document extraction, using character and document recognition algorithms to extract the relevant data. A innovative capture process often includes several recognition modules providing classification features in addition to the text-based classification used in the traditional capturing and processing solutions.



Recognition technologies/capabilities include:

- **Machine and hand print recognition.** Also called Automatic form recognition.
- **Optical character recognition (OCR),** is the electronic translation of scanned images of handwritten, typewritten or printed text into machine-encoded text.
- **Intelligent document recognition (IDR)** IDR software analyze the topology and the content of documents to make intelligent assessments of document type and key data required.
- **Magnetic ink character recognition (MICR)** is a character recognition system that is widely used in the banking industry for cheque processing. It involves using a stylized font and magnetic ink to print characters in a document.
- **MICR Fonts** The MICR E-13B is a widely accepted standard in the North America and European countries for printing MICR characters.
- **Optical Mark Recognition (OMR),** is a process where the software determines whether a response has been entered based on what amount of the interior area of a circle or box was filled in by the user.
- **Recognition and Classification of Figures in PDF Documents** Portable Document Formats (PDF) based documents has been used for many years, and became the first standard for digital document exchange and archiving.
- **Bar Code** - Most packages interpret horizontally or vertically printed or affixed Bar Codes
- **Merged Data Fields** - By using an external database file, many key fields can have data merged and printed onto the form and interpreted along with the User entered fields

Figure 4 shows an example of a scanned document (invoice) that is imported in a data capturing system. Via advanced OCR technology the scanned document becomes not just a scanned image, but the data on the document is recognized (e.g. invoice number, dates, VAT Nr., article numbers, etc.)

Name	Value
Date/Credit	BLUR
Currency	720-5405662-58
BankNo	806047720743
VATNo	4320074152
POBNumber	80275447
InvoiceNumber	10072009
InvoiceDate	1336.00
NetValue	245.56
VatValue	1.616.36
GrossValue	

Figure 4 - Automated recognition through OCR technology.

To reduce costs a full focus on possible process improvements from the initiation of the process to its completion is important since this is one of the main drivers of workflow solutions. A document based workflow solution addresses the users in the process and involves them when required while integrating to other systems to trigger functions. This is more cost efficient than having users searching for tasks to be performed and follow documented procedures to complete the tasks by updating one or more systems.



The supplier invoice process is often a well-defined process that can easily be automated to a very high degree. There are many other processes that can be implemented in a workflow system and automated, such as purchase requisition processes.

Active document processing solutions are rapidly gaining market share in terms of implementation numbers. There is an increased demand for solutions that automate the process and involve users when required rather than simple file/folder solutions where users always have to look for what is changed and therefore need to be processed. Processing solutions are a valuable extension of any ERP-type solution to automate both existing processes in the ERP and the processes that are not covered by the ERP.

Two highlighted functions within a document recognition and classification process are the “automated classification” and the “highly automated extraction of meta-data”.

Automated classification

Automated classification makes it possible to nearly recognize any type of incoming document. It can read and understand the content of the document and match it with certain criteria to determine what type of document it is and what to do with it. Automated classification is mostly used in digital mailroom applications where there is a large variety of incoming documents. Documents that need to be distributed to different people or departments. Another example is the classification of incoming documents and to link them to specific tasks. When document type A is coming in, it just needs to be stored in the customer case folder. When document type B comes in, the case folder needs to be activated and routed to a clerk for processing.

Automated classification works well with in environments where the diversity of incoming documents is large, but the documents are well structured so that recognition can take place on keywords, logo's, sentences, specific numbers or overall lay-out. Structured forms are an even better target for automated classification. First the type of form is recognized and secondly the content is extracted by using predefined overlay templates.

Highly automated extraction of meta-data

Documents entering an organization need to be interpreted and based on the content several actions will be done by the employee. The employee usually reads the incoming document and verifies the content with internal applications, either retyping information from the incoming document or comparing information. With a highly automated extraction of meta-data from the document, such manual labor intensive processes can be eliminated or minimized. The techniques and features and functions of today's software are capable of recognizing any incoming documents based on keywords, phrases, logo's or style. With e.g. statements type of documents it becomes easy to recognize the article lines, the totals, the address header and confirmation numbers. With the automated classification and recognition process the sending of the imaged document becomes obsolete. Just the data can be passed through the business process.



A successful deployment of an “automated recognition and classification process” solution can be reached when the following recommendations are followed.

Preconditions

- Can documents be classified in specific document types or categories?
- Are the incoming documents unstructured but from a quality perspective high enough for OCR?
- Is there a great diversity of incoming documents that need to be distributed to a wide audience?
- Is the business process supported if documents are automatically classified?
- Is there a need for the business process to “understand” the content of the document?

Implementation process

- Classify the incoming documents on a manual basis. What are the distinguishing marks?
- Assemble large sets of sample documents for each document that needs a unique classification.
- Highlight the unique remarks from a classification perspective.
- Highlight the content of each document that needs to be extracted for the meta-data.
- Set-up the classification and recognition application through an iterative approach. At least three learning cycles need to be performed.
- Set-up a test environment.
- Perform the in-house tests.
- Evaluate results.
- Enhance recognition and classification.
- Final tests
- Deployment.
- Constant enhancements for at least a one year period are needed.

Automated recognition and classification of incoming documents is the ultimate innovation for enabling an efficient and effective business process. The automated recognition and classification reduces the manual labor at the start of a digital process significantly. Using these techniques makes it possible to implement Straight through Processing for standardized documents and makes it possible to handle the exceptions efficiently. The recognition makes sure the right meta-data is passed along, and the classification makes sure the document is sent to the right department.



4.5 The digital mailroom – incoming and outgoing

The Digital Mailroom as an innovation is there when documents are not only converted to images and sent electronically to the recipient, but when documents are converted to intelligent pieces of information. The intelligence is the meta-data and the content of the document which can be used directly in business applications. The digital mailroom is not just for the incoming mail. Also the outgoing mail is part of the digital mailroom. Why keep sending physical documents if the recipient is better helped with just the meta-data and content in electronic form.

Electronic and physical mail volumes continue to grow, stimulated by business growth and mobile work forces (flex offices and desks). A typical medium sized company processes 100.000 pieces of mail each month and services over 20 departments. The need for corporate compliance and accountability forced large corporations to invest heavily in information backup, storage systems, and compliance solutions.

By digitizing the incoming mail process, and indexing the documents before the business process starts, the organization will not only gain control of the internal mail processes, but will have the opportunity to combine electronic mail formats (e-mail, fax) in the same document processing flow. By implementing a digital mailroom designed as a central platform for information capture and validation, the organization will bring rationality to mail processing and significant gains in productivity and customer service.

The costs of handling paper documents in a typical organization are usually not well known. Table 1 shows the average cost of managing and handling documents. All mentioned activities and costs are significant. This is one of the reasons that large companies and national government organizations already have a digital mailroom solution. The potential cost reduction is about 10% of the total company turnover.

Table 1 - Costs of handling paper documents

Activity	Estimated cost
Cost of classifying and archiving a document	€ 1,-
Cost of searching for a document	€ 5 to 100
Cost of a faulty-archived document	€ 150,-
Proportion of faulty archived documents	3% of the volume of documents
Total cost of managing faulty archived documents	3 to 8% of the company turnover

With a digital mailroom, the physical document access and distribution limitation can be overcome easily. After receiving, the documents are directly accessible for the relevant staff, independently of their working location. The digital mailroom solution must be able to handle, identify, capture, route, and store automatically a large diversity of document types (both in paper and printed formats).

The major task of a digital mailroom is to capture all incoming "documents", digitize them where necessary, classify them and distribute the "documents" to



the appropriate business department. As customers send different type of documents via different channels, the digital mailroom must receive all these documents in a central repository for further processing. The classification and extraction technique enables a generic data capture with intelligence to make it possible to route these documents to the right destination in the organization/business system.

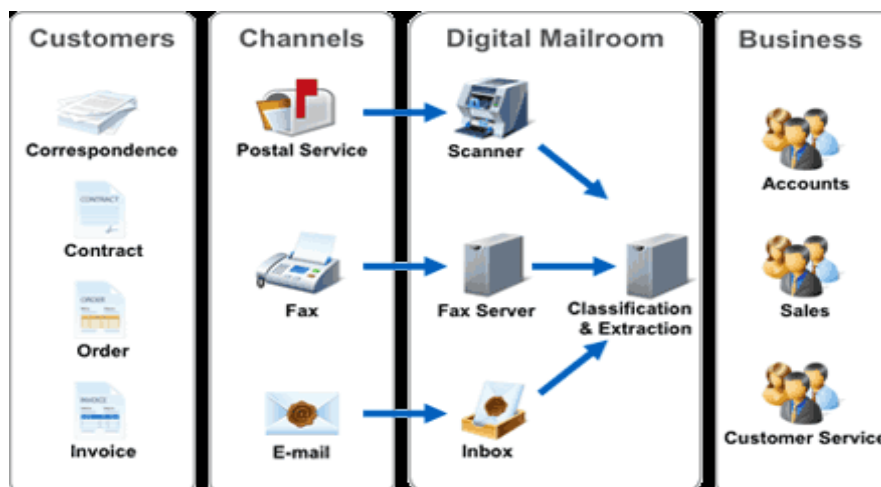


Figure 5 - Process flow of a digital mailroom

Channels: An incoming document will be delivered to the digital mailroom solution. Paper documents are scanned with a professional document scanner or MFD. Digitally available document files (like MS Word, PDF, etc.) can be directly handled in the capturing process. Upfront defined e-mail boxes and fax servers can be monitored to be able to convey this document (including its attachments) into the capturing process.

Classification&extraction: The next step is the classification and extraction of the data from the digital documents. The real power of the digital mailroom is the use of very strong OCR and classification techniques in which a large variety of unstructured documents can be identified and classified automatically. The classification technology, which is part of the OCR transformation process, is using different classification methods, to define the right document type (e.g. invoice, HRM doc. logistic documents etc.). As soon as the right document type has been defined, the classification and extraction process has the task to read the relevant meta-data from the document. Database look-up functions make it possible to verify the recognized information versus an underlying database system to add additional information.

Business: The Documents, digitalized, classified with meta-data information can be delivered to the business departments and the applications used like a DMS, mail registration, CRM or ERP. This can be done in different electronic formats (standards), enabling the delivery of the exact data needed for a specific underlying system or process. The documents can be directly placed in the workflow of the corresponding business process for further distribution within the organization.



Business example. A Printed invoice arrives to be scanned; the OCR module recognizes the text, and adds metadata to the recognized text. The classification and extraction module recognizes the specific words and numbers in the text like order number, invoice number, amount etc. The intelligence behind these solutions as well as the self learning system makes it possible to deliver the extracted data to the business/ERP system in the right format without any manual intervention.

Digital mailrooms not only process incoming correspondence but also manage outgoing mail which is an equally crucial part of the information supply chain of an organization. Connecting business applications(computer to computer) via XML standards can provide pre-recognizable electronic documents without the need for complex IT integration. Digital mailrooms are not the end, but the start of an opportunity to apply process control to supply chains, product development and closed loop views of customers.

The reported benefits of a digital mailroom are:

- Shorter runtime of the mail delivery cycle
- Chance of losing documents is minimized
- Less dependent to manual actions by which operational costs are reduced (in the mailroom, as in the rest of the organization)
- Streamlining information input to back office systems
- Improved information position towards clients, suppliers and the intern organization
- Storage of al incoming documents in a safe, (digital) size
- The staff is not depended to the location of the Digital mailroom

Fully implemented digital mailrooms can lead to significant benefits for the organization.

- Print cost reduced by 60%
- Optimize document management which can save 45% of the labour
- Data enter, 50% of the data-entry tasks can be reduced
- Process improvement 10% less costs
- Less time needed regarding archiving which can be 80% of current costs.

Two highlighted functions within a digital mailroom are the "automated processing and forwarding" and the "digital delivery".

Automated Processing and Forwarding

The main principle of a digital mailroom is the scanning, recognition and classification of documents without (or as less as possible) manual intervention. The mailroom receives all incoming documents through all physical and electronic channels. After scanning the documents the process of recognition, classification and data extraction is started. At the end of the process a digital document and/or the extracted data is available for further processing. There is no delay any more in pre-sorting the letters, internal distribution, interpreting the letters, handling the letters and filing the letters.



Digital Delivery

A digital mailroom is very capable of sending documents to its recipient through electronic channels. Sending a document by a digital mailroom is a different concept than sending an e-mail with an attachment. The electronic delivery must match the physical mail delivery options. It should be secure, reliable, to be traced and with the same legal constraints as physical mail. By implementing a digital mailroom for outgoing mail the savings could be significant. The typical larger organizations spend millions on postage annually. In most countries around Europe the digital sending of legal binding documents as policies, invoices, purchase orders, etc. can be sent electronically.

A successful deployment of a "digital mailroom" solution can be reached when the following recommendations are followed.

Preconditions

- The organization should already have some experience with scanning, digital mail handling and archiving.
- The business processes support the interaction with electronic data exchange versus the data-entry of a clerk.
- The incoming mail volumes are substantial. Several hundred or above mail pieces on a daily basis.
- The incoming documents are unstructured but can be structured by document type and the relevant data needed for extraction

Implementation process

- Analyse the incoming documents into categories, based on departments, applications or actions to be done.
- Describe the relevant data which is needed for the business applications.
- Analyse which business rules should be applied for automated or manual processes.
- Define the integration points.
- Develop the scanning, recognition and classification application.
- Test it for several months to assure a good working condition.
- Implement the integration aspects.
- Implement the digital mailroom concept for the incoming documents.

A digital mailroom goes beyond the pure scanning of documents and the distribution of the digitized document. A digital mailroom interprets the letter, its content and creates an automated task in the further business processes. Making possible that straight through processing can be applied for the standard activities and the exceptions will get the proper attention. Clerks can spend more time on these exceptional cases, lifting the overall customer satisfaction feeling with one or two points.



4.6 Invoice processing

Combining the techniques of scanning, recognition and classification in a digital mailroom concept makes it possible to automate certain business processes to a very high level. In this chapter the results of the scanning and capturing process enabling the automated routing of documents to the business applications, ERP system or invoice systems will be discussed. Not just scanned documents via a MFD, flat bed scanner or production scanners, but also via new work tools like Mobile Phone's, and EDI technology.

To address this processing and to optimize the information flow more and more ERP application vendors offer process solutions connectors. This becomes interesting to keep the user more in line/connected with their system, while processing supporting information.

Another trend is a tight cooperation where the capture vendor offers a special version which is closely in line with ERP functionality. With this the captured documents/invoices can be immediately checked with the purchase documents and automatically routed to the right person or location to be signed off. Especially for bulk invoices and frame orders, this saves a lot of time, money and labor.

The supplier sends an invoice, no matter in which format, as soon as the product(s) or services have been delivered. The invoice can be approved and paid the same day via a web based system, integrated into the business system. No matter where the relevant staff is located. Via the e-mail, smart phone the person who ordered the goods gets the information and can approve it and send it to his budget holder and manager to sign it off. As soon as the manager signs it off, the payment will be done automatically. In half a day the document is approved and the supplier could have the money on his account.

For just invoices, the various software vendors develop special editions or targeted applications, One hundred percent focused on invoice details; for example, it can check tax number, bank details, company name and line items. If the invoice matches the purchase order, it is automatically posted into the ERP/business or admin system. Any discrepancies are detected and presented to the user. After invoices are automatically verified, all the accounting tasks can be done through one interface. Invoices can be posted for payment, view purchase orders, jump to the vendor data and more, all with a single click of the mouse.



Figure 6 - Data-entry form used in invoice processing

If there are any errors on the invoice, or if there is no purchase order available (as with general expense invoices), the invoice is passed on to the electronic workflow. As soon as the captured documents have been verified by the back-end system, the workflow solution moves the incoming invoices into the ERP/Business or Admin system. The invoices are routed to the correct people who can approve them or pass them on for further processing. ERP/Admin users can handle exceptions, coding and invoice approval inside their working environment. This processing part uses the existing ERP system which means that users can work in an environment they are familiar with. Users can also connect via a web browser and approve invoices wherever they are. This means no more bottlenecks and delays when people are out of the office.

Not just for the internal users, but also for the suppliers there are great benefits. Via a web portal suppliers can log in to a specific part of the system to check the status of their invoices. The data is gathered from the ERP/Business or Admin system. The finance department controls which suppliers can access the portal and what they are allowed to see. It doesn't matter how the suppliers send in their invoices (paper, fax, email, EDI, or through web portal itself) – all invoices can be presented together with information on their current status. If a supplier wants to change the payment conditions, they can do so online. This way, the supplier gets the payment faster and customer can benefit from a higher discount (payment discount). It is possible to allow suppliers to enter the entire invoice in a web portal, ensuring swift and smooth processing. Via automatic response (mail) functions, the ERP system can allow the suppliers to check the status of their invoices. Via the same system, suppliers can request the status of invoices via email by simply providing an invoice number in the subject line of an email to a specified email address. The system automatically replies with invoice details such as date the invoice was received, its status, payment information (if applicable) and other pertinent

Processing EDI invoices with errors in ERP is usually very costly and time-consuming. This is mainly due to the complicated cross-department communication often required in error handling. One of the reasons some capturing solutions provide a kind of EDI cockpit to overcome this dilemma, making it possible to transfer incoming e-invoices with errors to the invoice part



of the ERP system. The relevant person/department can complete or correct the invoice and start the workflow as usual.

To approve the invoices via a mobile system, is usually an add-on to the ERP and capturing solution. Whenever there is an invoice to approve in web based solution, the recipient gets an email notification about this. This notification can be opened in a mobile phone or any other electronic device (tablet PC's). The email contains three different links, one to approve the invoice, one to reject the invoice and one to add further information. By clicking on one of the links, a message is sent to web based system of the Capturing/ERP solution and the invoice is processed.

Invoice processing is one of the key innovative applications based on the scanning, capture and classification techniques currently available. By applying these techniques, specifically designed for invoice recognition, the whole process of paper invoice handling can be automated. An invoice process that just is not labor intensive. It frequently results in calls from suppliers asking about the status of their invoice. Where a paper process can easily lead to unsatisfied suppliers, the electronic process makes sure the supplier is always up to date about where his invoice is in the process.

Invoice processing has several tangible but also many intangible benefits.

- Cost reduction in labor
- Customer satisfaction of the suppliers
- No more delays in new product orders due to outstanding debts



5 Automated Document Capture Management

5.1 Main properties

An automated Document Capture Management application covers the total process flow and the management of a scanning process with the business applications. Hardcopy documents are converted into digital files to be stored in business system libraries without requiring document conversion services. Document properties are detected at the capture process using automated document recognition functions. Based on this information the document can be sent directly to the specified location within the business system for storage. Here it is immediately available for retrieval by authorized business system users. The business system users can easily include paper documents in their digital workflows and supporting document lifecycle management processes. The Automated Document Capture Management solution is dynamically integrated with the business system server. This to assure that document and data from the Automated Document Capture Management solution will be stored, indexed, and managed consistent with other existing content management procedures.

Automated Document Capture Management solutions are made up of complete modules and a platform which allows you to create effective process support to suit your own specific circumstances.

The Automated Document Capturing Management solutions focus heavily on the end to end automation of the document capturing process. Not just scanning and capturing printed documents (delivering an image), but also handling and capturing, recognizing electronic documents like Fax server data, PDF, Text and XML documents. All these various type of documents can be handled by one Automated Document Capturing Management solution, to be able to import automatically, without manual intervention, in the business system.

The main functionality components of an Automated Document Capture Management solution are listed below:

- All Required documents (Printed, Fax, Text, XML, PDF, and image) can be captured via a scanner or MFD at the branch or at the customer service center at high quality and routed to the back end for further processing.
- Instead of employees typing data from printed or faxed orders manually, risking delays and errors, the platform captures the printed or faxed trade documents automatically at the point of entry.
- Multi-page documents can be separated automatically, saving employees from manual sorting tasks.
- All documents and forms are automatically classified, and metadata is extracted and validated to ensure fast availability of high quality data at the front and back end. If any data is missing or incorrect, an automated alert function triggers exception handling and correction. Customers and employees can trust that only complete and correct data is sent to the back office, ensuring high data quality and processing efficiency.
- Upon completion of the account application, customers can be notified about the status automatically via paper, fax, email, SMS or voicemail. These same communication channels can also be used to promote additional products and services to generate more business – and a more positive customer experience.



- The initiation of straight-through processing of data and business decisions based on company specific rules and knowledge bases improves process efficiency and ensures compliance along the customer agreement lifecycle – from origination and approval to auditing or resale.
- The same platform can be used to promote further offerings and services to generate more business – and positive customer experience. It can be used for customer specific communication and also for broadcasting messages and information to an entire customer segment to turn customer experience into more business.
- The intake of all critical customer data and its flow throughout the entire organization is traceable and auditable from scan to final archive, improving regulatory compliance.

The next five main properties have an impact on the Document Capture Management architecture and have to be defined for each project. Each of the five main properties has a generic description and a list of options. To prepare the architecture development discussion(s) for each of the five main properties the "What are ..." questions must be answered.

Processed document types

The processed document types have a significant impact on the hardware and software configuration. There are the physical characteristics of the processed documents. What sizes of documents will be processed; A4, A3, A5? Apart from the sizes the paper types are an essential characteristic. Is it plain A4 copy or laser printing paper, or can it be thicker or thinner than usual. Next to the physical characteristics there are the content characteristics. Are the processed documents somewhat structured or unstructured. Are they printed or handwritten? Is there a requirement to extract data from the processed documents? From a process perspective the processed document types have an influence on the recognition, management, control and capacity needs.

- Invoices, purchase orders or other type of transactional type of documents.
- Forms and surveys.
- Business correspondence.
- In-house generated documents or created by others.
- Drawings, photo's
- Contract documents

Business processes

The documents processed are part of a business process. The business process itself is usually not considered when deploying a new or innovative solution for the document scanning facilities. However evaluating the corresponding business processes and evaluating the moments where the documents are used by the employees will have an influence on the process configuration. When documents or its content is to be used in various business processes and by either employees or through a programmatic integration, the understanding of the business processes is important.

- New account opening
- Mortgage or credit requests
- Invoice and/or claims processing
- Purchase order processing



Business goals

The business goals are a “translation” of the corporate strategic and business goals to a goal which can be related to the document capture processes. The objective is to do this translation and not define the obvious goals of efficiency and some cost savings. The corporate goals have a more tangible objective which needs to be set for the deployment of the innovative solution also.

- Cost savings in operational processes
- Raise revenue per customer through higher (better) customer services
- Ability to support a Straight Through Processing for standard requests.
- Raise customer and/or supplier satisfaction through a monitored and automated process for the document handling.

Ownership

Who is or should be the owner of the document capture and classification processes from an innovative perspective. From an operational perspective the ownership or business responsibility is within Facility Management as owner of the mailroom. The software is within the responsibility of IT. The processing of the documents and handling of the content is within the responsibility of the business owner. The archival and destroying of the physical paper is the responsibility of legal. The list of owners in some part of the process can be very long. The ability to innovate is often limited due to the diversified ownership. When innovation is considered from a business perspective and at a corporate level, a dedicated business manager or “project manager” with accountability is needed.

- Facility Management
- Corporate Services
- Information Technology (IT)
- Legal
- Business Management (LOB)
- Procurement
- Board level

Outsourcing

Outsourcing as a corporate initiative for non-core activities has a great impact on the deployment of innovative solutions or business processes. The historic experience of outsourcing contracts shows that innovation is not a high priority once the outsourcing starts. The priority is on the cost savings and from a vendor perspective the recovery of the margin due to the cost saving pressure. Outsourcing can be done in various ways and gradients. From complete outsourcing of the business process, to “outsourcing” of the software purchase process. Outsourcing the document capture facility when innovation is needed is not a preferred option.

- In-house outsourcing
- Managed Service Provider (out-house)
- Software As A Service
- Business Process Outsourcing
- Pay per usage



5.2 Document Capture Management Architecture

A Automated Document Capture Management solution is a combination of various hardware and software components. The purpose of the architecture is to link the various components together. This to create an infrastructure that can take input from multiple sources, starts a workflow to process the input and deliver the output (document and/or meta-data) to the business process or business applications. The input is a "document" that contains information for a recipient. The exact representation of the document can vary between the physical A4 page and an XML message. The workflow process converts, optimizes, recognizes and classifies the electronic document from the source to a format and representation that can be understood by the recipient. The output is the information for the recipient or business application. The usual interpretation of this process is a paper document, which is converted to an image, optimized, OCR is done and relevant meta-data is extracted. Many variants of the process do exist. The input can be an XML file, a Word document or a fax document. The output can be an image, meta-data, full-text data, document type, PDF or PDF/A document, etc. To do the conversion from input to output, integration is necessary with other business applications like ERP, CRM, EDMS or DBMS.

The infrastructure in which an Automated Capture Process Management solution is deployed is often a complex and business critical environment of hardware and software elements. The business criticality and complexity is not always well understood in organizations that are relying on heavy customer contact via document exchange. All elements in the infrastructure must work well with each other to produce the electronic documents and meta-data at the right moment and have them sent to the right recipient. The emphasis in the infrastructure is on, "**all elements**". Document Capture Management architecture exists of a lot of pieces that must be tightly integrated by software, hardware and/or people. The architecture is also not a stand-alone environment. It is integrated into other business applications and is an essential part of the corporate performance. The architecture must resemble the business criticality and complex integration issues.

The first question that must be answered from an architecture perspective is regarding the business criticality. What would be the impact to the organization if no documents could be captured and processed for one day, several days, one week or even longer?

The second question regarding the architecture is the integration points. With what applications, systems, databases, need the Document Capture Management configuration to be integrated with?

The drawing in Figure 7 is a schematic representation of the Content Capture and Management configuration and its (possible) integration elements.

The central component is the technology component that transforms the input into the required output. This can be a combination of multiple software components and hardware components. Although rare, a configuration without archival of the imaged documents is possible when output (data) is only required for the business applications. The required software components are depending on the functional needs and/or the technical constraints. The essence is that the core functionality is not one system or one application. It is a mix of various components assembled together and able to produce the output based on the input and the requirements.

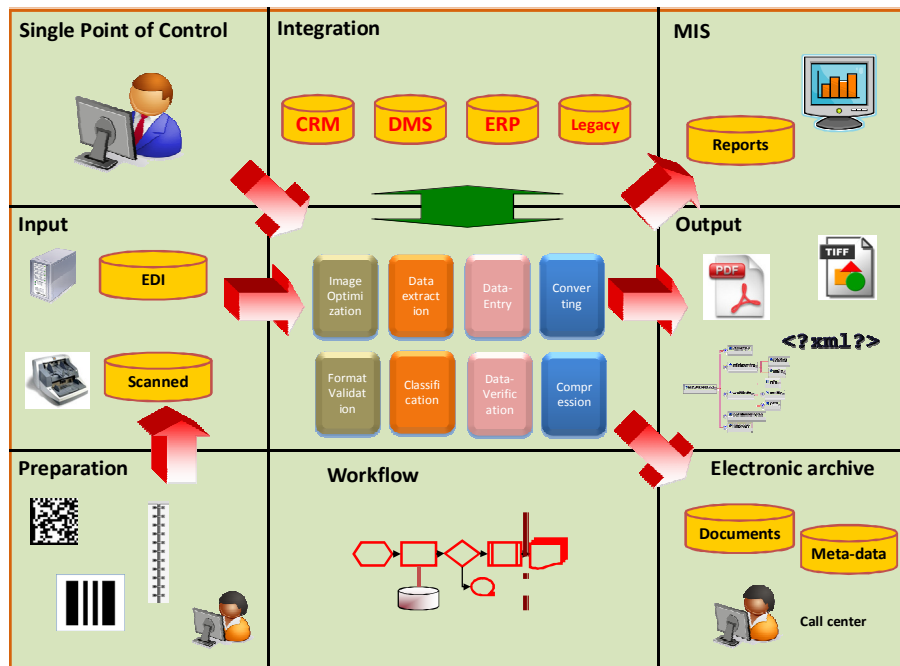


Figure 7 - Automated Content Capture and Management model

Below an explanation of each of the components of the Automated Content Capture and Processing management architecture.

- **Single Point of Control** – The whole architecture of hardware and software components should be managed from one centralized application. The management application will give an overview of the current state, progress of jobs, users logged on and the history of processed documents, statistics, etc.
- **Integration**–An integration with various business applications is needed to retrieve e.g. customer data during the data-entry process or send data to e.g. an ERP application to process an invoice. Integrations are an important part of the architecture. Building the integrations should not be time consuming or customer build. Through open standards like web services, SOAP or an XML interface the data should be transferred.
- **Management Information System (MIS)** – Management Information reports on the processed documents, documents automatically classified, time stamps, who did what when and how many documents are processed in each of the process steps. Based on the Management Information the business can track the business performance and IT can track the application performance.
- **Input** – Input can come from various sources. The obvious one is paper, but input sources that can be handled are the Electronic Data Interchange format. Other sources to be recognized are e-mail, fax, FTP or applications.
- **Output** – The output formats that need to be handled can also be diverse. Apart from the TIFF format, alternatives are PDF or PDF/A and the output of meta-data in XML format and the full-text recognized data.
- **Preparation** – Paper documents rarely come in a shape that they are ready for scanning. A specific preparation is needed to scan the documents as separate documents. Specific pages with barcodes can be used to indicate the start of a new set or indicate a new document. Barcodes can



also be used in the recognition process at the scanner to identify specific customer numbers or type of correspondence. The preparation is tightly linked with the Input module. When the Input module characteristics change, it can be needed to change also the preparation steps.

- **Workflow** – The workflow with respect to an Automated Content Capture and Process management architecture is the flow of a document from input to output with steps like data recognition, deskew, classification, data-entry and export. The workflow is dependent on the document type processed and the business requirements. Assigning a specific workflow as part of this module is usually done through a graphical representation of the steps and configuring the functionality.
- **Electronic archive** – The electronic archive stores the scanned documents and the meta-data for retrieval by employees and customers through a client interface or (web) portal.

All of the above mentioned elements make up the Automated Content Capture and Process Management architecture. Not all modules need to come from one vendor or solution provider. A mix is also feasible. In designing the architecture it is however crucial to define the integration points between these modules.



6 Enterprise Capture Management

6.1 Integration with the Document Management System

Document Management Solutions (DMS) have developed towards Enterprise Content Management solutions. This focus on managing all unstructured information within the total organization (the Enterprise) has been introduced in the early 2000. The unstructured information is within the document text files, image files, emails, office files, video or voice.

In the 1990 timeframe DMS solution were called Document Image Systems (DIS). DIS systems were primarily used to capture and store paper documents in electronic form on optical disks for departmental file/folder retrieval applications. The first generations of these systems were really standalone and based on proprietary hardware and software.

Office floor space savings and secure storage of large amount of document were the implementation reasons for DIS systems. It was electronic filing cabinets for workgroups and small departments.

With the introduction of the "standard" Windows PC and local area network technology, DIS systems got a more departmental use. Sharing electronic copies of documents across the department at the same time and some simple forms of workflow increased the usability of the systems toward work process optimization.

Document scanning technology was initially an integral part of the DIS systems. There was often more money made on selling scanners and high resolution workstation then on the DIS software. The scanning functions were tightly integrated within the DIS software and simple of nature. Just converting paper documents to flat image files, often in the TIFF format. Image file compression was done with special hardware add-on cards.

Second generation DIS systems included the possibility to extract information from the scanned document by using OCR technology within highly structure and pre-defined overlay templates. The scan operator had to tell the DIS system what document type was being scanned to use the appropriated overlay for keyword extraction.

DIS systems became DMS systems and were more and more based on standard PC workstation running Windows, SQL-databases and Explorer-like filing structures. The DIS/DMS software market developed quickly. Scanning software and subsystems became a separate market with dedicated suppliers.

Over the years DMS software solutions developed towards ECM solutions with the purpose to manage all unstructured information and document creation and management processes in the organization. The emphasis of the software vendors was more towards the development of ECM, collaboration and process management functions. Scanning documents was seen as one of the ways to get document based information in the system. ECM solutions had an "open interfaces" towards the various scanning subsystems available. Scanning, quality control and if needed data extraction were all performed within the scanning subsystem. Often the interface between the scanning solution and the ECM systems was of a simple batch file import nature.



This loosely integration had several disadvantages. First of all the user interface and way of document handling is different in both environments. Secondly, if the image released with a bad quality, or the pages sequence was incorrect these errors had to be corrected in the ECM system or special software had to be developed to notify the scanner operator to rescan the document. Also if extracted data of keyword information was incorrect the image could be stored in the wrong file/folder without anyone noticing.

The mid-tier and local DMS/ECM software vendors that often have a more vertical market or process focused solution and market approach use capture toolkits to integrated the document and data capture functions with their own software. Also the size of the implementation didn't justify a dedicated capture subsystem. Due to this integration document and data capture was more tightly integrated in the total solution offered.

It were the larger ECM software vendors that realized that organization not only create unstructured information internally but continued to receive a lot of unstructured information via postal mail. Having let the development of capture subsystems to capture vendors they now started (2004 and onwards) to acquire capture vendors to integrated their functions within their own software suite. Due to this acquisition trends several previously independent capture vendors disappeared from the market.

On the hardware side of the market, scanner and MFD manufactures were starting to add enhanced document scanning software functions to their systems. This primary to improve the ease of use and to produce high quality images. It are the MFD vendors that could benefit most from the embedded PC processing power in their MFD's. Using the machine programmable interfaces MFD systems got easy to use scan-to-file, scan-to-email or scan-to-desktop functions. Some vendors also developed specific scanning integration functions toward the most popular ECM software suites.

Several MFD vendors started to offer basic document management and storage applications. The MFD scanning functions are directly interfacing with these applications. Users can easily build their own local document filing applications without having to involve the IT department. Keywords or indexing data is entered with the MFD console. Using predefined document templates automated document classification and keyword extraction can take place. This also to support document capture activities for non-frequent users.

6.2 Integration with process automation

Within the ECM software suite market there is a special segment that focuses on business process and workflow automation. This market has it's origin in simple user driven or distribution list based document image routing software. Over time this market has developed via straight forward document process automation via electronic workflow processing toward full business process management. Often the WFM/BPM vendors did position their software towards market segment with specific document and process intensive applications or procedures. Example are claims processing, mortgage applications, new account opening, loan requests and others.

Due to the fact that most of these processes start at the moment the request or claim document enters the organization, scanning functions were always a part of or well integrated within the WFM/BPM solution. The applications are often departmental oriented. This made it possible to implement specific scanning



profiles form pre-sorted document types to support efficient document handling, control and keyword extraction.

With the further development of document recognition and information extraction functions in the scanning subsystems and process automation and business application integration functions in the BPM software possibilities of Straight Trough Processing (STP) became relevant. With STP information is automatically capture and processed by business applications without any human intervention or processing. Often STP applications are using web portal and electronic forms to support the customer to file his or her information or request. Advanced document recognition and data extraction software makes STP processing also possible for paper documents and forms.

Another advantage of these features is that the document capture activity no longer has to be performed by skilled employees in the processing department itself but can become part of the more generic document capture service from a digital mailroom or even a Business Process Outsource service provider.

6.3 Integration with business applications and archives

Document capture and processing is seldom an independent and stand alone activity in an organization. It always involves or is connected to line of business applications. The line of business application stores and processes the relevant data elements about the customer, the transaction, the production schedule, etc. The supporting documents are handled and stored in de DMS systems. The line of business application also produces output itself. This can be production overviews, confirmation letters, transaction overviews, etc. This output is often printed and send to the customer as confirmation document of which a electronic copy is stored in the DMS systems. This to support a cheaper way of storage and an integrated customer or case file.

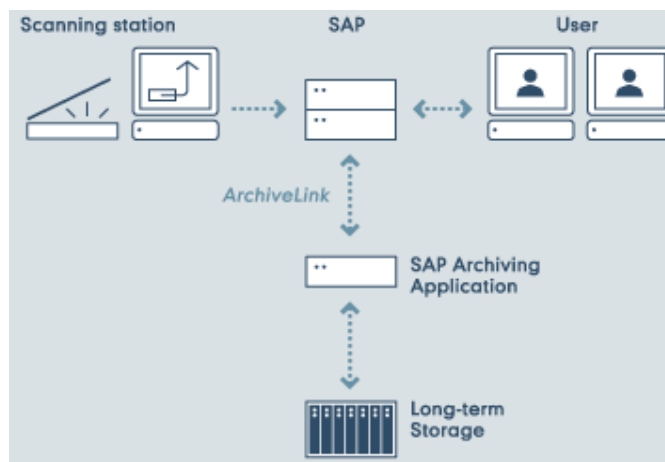


Figure 8 - Document scanning and storage with ERP integration

Usually it are third-party vendors that develop additional applications around business systems. In **Fout! Verwijzingsbron niet gevonden.** the ERP system is "extended" by and ECM system that handle document scanning and storage. As the production ERP database grows, Data Archiving for ERP Solutions (like SAP) is a solution the organization can apply to ensure cheaper and long term, secure access to historical data. Once documents or data have been archived, users can retrieve them within seconds via the ERP user interface. Accelerate backup and recovery times, reduce administrative costs, minimize hardware costs and



decrease the time it takes to implement ERP upgrades. (Usually these extras on ERP systems are costly).

In addition, COLD and spool files can be imported from legacy systems in ASCII or EBCDIC formats into the Archive & Storage Services repository, which indexes the documents and stores the index in ERP system (SAP), enabling SAP users to access the COLD data within the ERP system.

There are capturing and processing solutions which provides OCR, Capturing recognition and processing = connectivity with ERP systems like described in the example based on Figure 8. However, the reality is that most of the solutions have strong sides and weaker sides. Or the solution is more oriented on the routing/processing to Archiving and ERP systems, or more focused on Scanning, recognizing data which can be delivered to a routing/processing system.

More and more ERP suppliers are offering connectivity with their solution. Via open architecture and open standards, the data entry (EDI and data capturing) can be easily connected to the ERP system. It is understandable these vendors would like to maintain their customers by offering new technologies and solutions. Examples of ERP suppliers which offer connectivity to distributed capturing and processing workflow are:

- SAP Application Integration SAP business suite (document capture and process automation)
- Navision (ADCS) (document capture and process automation)
- BAAN Automated Data Collection (ADC) (document capture and process automation)
- PEOPLESOFT-ORACLE-Imaging and Process management (document capture and process automation)

These 4 and many other ERP vendors are moving into the document capturing and processing business. The two main reasons are the distributed capturing – processing delivers a significant process optimization possibility for organizations. When users automate and manage the document related workflow, they can much better control and manage the activities and volumes around hardware (MFD/Scanning) and ERP/business systems.



7 SPECIAL: The Multi-Function Device

This special chapter in this report describes the role of the Multi-Functional Device (MFD) in the capture process. This chapter will investigate more in depth the role of the MFD as an important device in the workflow of scanning, capturing and processing of electronic documents and forms. First some background information about the MFD, its current role, developments and the future expectation. Furthermore the capturing, processing and connectivity with ERP/business systems is explained.

Today's Multi-Functional Devices combine high quality scanning with full color printing and faxing in one easy to operate and functional integrated device. Copying is just a combination of these functions. The MFD processing unit is a powerful PC computer with standard network connectivity, preconfigured application functions and advanced systems management functions. From hardware perspective there will only be incremental developments on the basic functions of the MFD. The most important developments are however in the use and integration of the MFD within the modern virtual office and "new way of working". The MFD will operate as a document portal or interchange point between the users, his documents and the different corporate business applications or information repositories.



General usage in the office

When copiers got network connected to support office printing and printers got scanners to support copying the Multi-Functional Device made its entrance into the office environment. The integration of all document processing functions in one single device, its network connectivity and the advance system management software delivered not only significant costs saving in printing costs but opened a whole new world of integrated document processing applications. Although, after several years of its introduction the MFD is still mostly used as an integrated scanning, printing and copying device. In this appliance it can and will continue to grow in market penetration and usage and the associated business volume for the vendors. Generic cost saving and green IT benefits as a result of further device optimization and operational services will attract users in all segments of the office market.

System replacements as a result of a shift to full color will also support business growth. The long term question however is if a "standard" MFD device will have a "right to play" in a fully digital world? A world where fixed working places with desktop computers are old fashion, office space per user is significantly reduced, mailrooms become capture service centers and because users are supported to work fully digital everywhere they are connected to a mobile phone service. A world where physical documents are disintegrating by OCR/ICR software to information fragments to support working with digital forms and information portals. A world where document printing to PDF-A is more environmental save and friendly then printing to paper? Also a world where electronic document management is losing its functional silo status, and becomes an integrated part of the middleware infrastructure or line of business applications.



MFD devices can play a significant role in this digital information and document processing world when they support and integrate with the generic office and non-office information and communication infrastructure as well fully support the document and information exchange between the users and their daily used business line applications.

Open architecture and connectivity of MFD

While using the basic and often network connected scan, copy, fax and print functionality, users are looking for more custom and process specific applications for their MFD systems. On the other side vendors are looking for business specific usage of their MFD systems to differentiate their offer towards vertical market segments. In Figure 9 the open architecture is illustrated, connectivity of the MFD the applications and backend systems. The availability of powerful standard PC based processing capabilities within the MFD systems supports the development of open systems architectures and connectivity and the introduction of application development toolkits for the MFD's.

There are two main technical approaches in the MFD market for creating software development tools: an embedded Java approach and a Web services approach. Each has certain strengths and limitations from the perspective of software developers and customers.

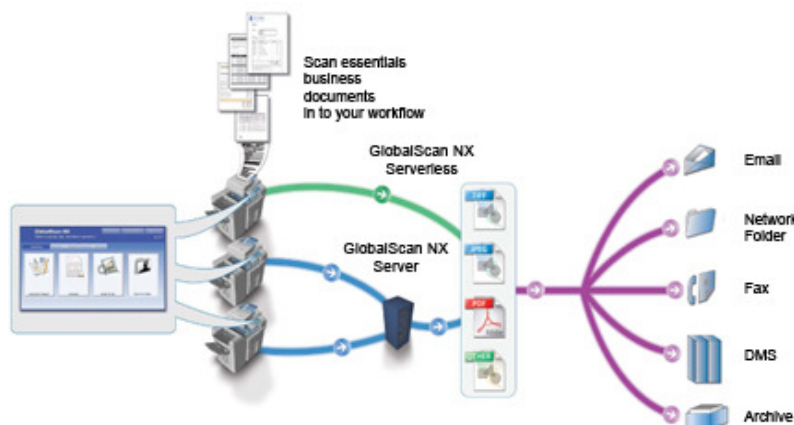


Figure 9 - The open architecture around the MFD

Embedded and integrated solutions:

The embedded Java approach in MFD software development arose first. It is exemplified by Ricoh's ESA, Canon's MEAP, XEROX EIP, and Lexmark's ESF. Samsung's OXA relies on JavaScript, which is different than Java, but has many of the same attributes in the context of MFD application development and deployment.

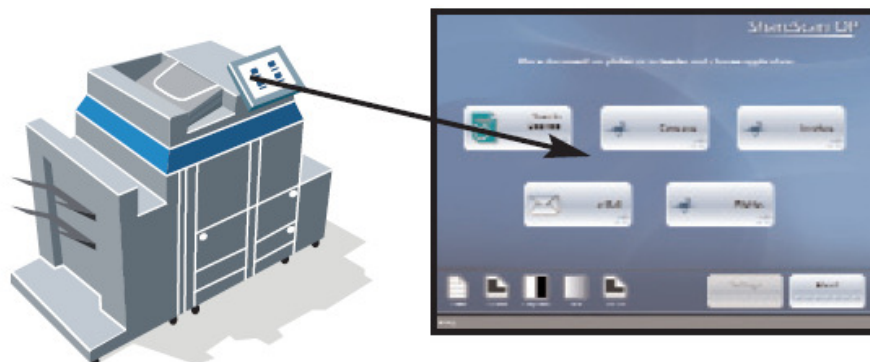


Figure 10 - Example of a customized MFD user panel

Java is a widely accessible and powerful programming language. With these platforms, one or more Java applications can reside inside an MFD, although there may also be a server. The application may perform a specific task (e.g., convert images to searchable PDF files), or the application may connect images and associated data to an external application. Although Java is easier to use than traditional programming languages, such as C or C++, it still requires well-trained programmers with a reasonable level of skill and experience. Java applications can be resource intensive in terms of the processing power and memory they require from an MFD. Because the same processor is used to operate the MFD and host these MFD applications, performance may slow down and limit the number of applications that can be accessed from a single machine. The Java approach has also proven somewhat cumbersome when it comes to designing a user interface for the MFD control panel. For this reason MFD application development is often done by systems integrators or vertical market focused software firms. Application development by end users will require a further enhancement in the ease of use of the API toolkits and application and interface design functions. Easy to use end user software development efforts are strongly supported and adopted by new visual application programming methods as supported by mobile phone and tablet PC companies. The success of their hardware devices is one to one connected to the availability of an easy to use application development environment and the sub sequential availability of a broad array of applications and gadgets. The ease of use of these toolkits will set a new standard in the end user based application development field. One option that certainly will be adopted and supported by MFD vendors in the near future.

Document captures applications embedded in the MFD

As the result of the fast acceptance of the “new way of working” concept, paper documents are no longer welcome or allowed in the office environment- we have to think green. The same time office workers have no fixed working place anymore and only very limited physical filing space. Also the introduction of remote working places or home office working support requires the digital availability of all information. Mainstream document capture of incoming postal mail documents is increasingly becoming part of high volume and multi-channel digital mailroom solution. A solution that can be implemented at the customer location or as an external service provided by a postal firm or a document outsource service provider. Since not all documents do enter an organization via the central mailroom, user organizations wants to benefit from their MFD and



document scanners to get also the other documents in the systems. Scan-to-PC, -user, -email or -repository are common used features to support the more ad-hoc document capture process. MFD devices are used to capture confidential or medical related documents in the specific classified departments. Capturing of these documents is done by the use of dedicated scanning templates or profiles to ensure the correct document identification and processing.

These templates are often integrated with Optical Character or Intelligent Character Recognition functions. These OCR/ICR technologies become much more critical to automatically identify scanned documents and support error free data extraction and auto classification functions. This to free the user from complex data entry activities at the keyboard of the MFD. Advance document and data capture applications offer great cost saving opportunities. One of the most popular applications in combination with MFD based scanning is invoice processing. Other frequently used applications are the handling of shipping and transport documents or expense claim document entry. When combining OCR/ICR with linguistic software, automatic document translation and summarization functions can be offered. After the document has been scanned the translation application read the text, using OCR/ICR, corrects the errors and activates the linguistic software. The result can be printed or retrieved as a text file. Most of these functions have nothing to do with the MFD itself but use the MFD as a document portal toward the application.

To support a broader array of information capture functions technologies regarding image recognition, dual byte character recognition (Asian and Japanese characters), images from digital cameras or mobile phones, barcode recognition are added to the MFD capture functions. These new technologies enable new applications and use of the MFD. Example applications are: Logistic Document capture(Data matrix and PQ barcode reading). International correspondence and invoice capture from Asian companies. Via a USB or SD card reader digital photos can be OCR-ed for image recognition applications, graphs and charts can be recognized enabling the recognition of reports. Applications like accident reporting or claim document and photo processing are to be imagined.

The MFD will not only be used as a document entry for specific applications, like described in previous paragraph, but for the midsize and midsize plus organizations, up to 100.000 documents, the MFD will be used only as a document entry/exclusively.

Manage the security of the distributed document capture and access

To support the distribute way of working within the "new way of working" concept and to benefit better from investments, like MFD's, in central office, it is important to keep control over the implemented electronic mailroom technologies for secure distributed document and information capture. This can vary from the simplest home-office multifunctional device towards mid-range remote office equipment.

Documents will be scanned remote, securely delivered to the central side and processed at a central server. With guaranteed audit trail and risk, governance and compliance support tracking and tracing. Logging of all distributed document processing steps and user involvement will require a new generation of user and access control software. Single click document process analysis and reporting within a user friendly dashboard environment will be needed.



In the same way as users are able to retrieve documents from a document repository for viewing on their workstation or mobile device, they will require MFD based document retrieval functions for document printing. Not that the MFD will be the main document retrieval and output device but the availability of these functions will be seen as a natural function of an MFD. Pre-programmed document retrieval applications with access to the document repositories within a company will be one of the many available MFD functions. Using the MFD as document capture and retrieval station will make it a real document portal or service point for end users. To prevent the availability of document information within the MFD after the document is securely delivered to or from the central side, short term document retention and secure electronic document shredding will be mandatory. These functions will become part of the document profile or document recognition outcome and will be defined as part of the overall companywide document and records management policy.

Document management and archiving

When MFD systems are being used as document service portal it immediately brings up the need for secure document management and storage. The MFD can just be the scanning device with the document processing, classification and transfer to a repository being done via a user workstation. But more and more the MFD is directly connected to the repository itself. To prevent risks for information loss or modification between the scanning and final storage step. Many MFD suppliers offer their own document management and storage solution. These are often basic in functionality and limited in the customization possibilities. Direct integration of the MFD as document portal with off the shelf document or content management software solution like IBM/ FileNet, EMC Documentum, OpenText or Microsoft SharePoint requires the use of the DMS or ECM vendors provided access and integration functions. These integrations are often customer application specific and therefore not applicable for generic use. The broader availability and more accepted use of SaaS or Cloud based ECM solutions creates the possibility for flexible document storage solutions with a low entry price but unlimited upscale capabilities. MFD vendors as well as ECM SaaS service providers will develop joined offerings to attract and support users in the small to medium accounts market segments. The ECM SaaS applications will use vertical market specific document capture and information retrieval templates. These will include vertical market specific naming conventions and functions to ease and accelerate the adaptation and use. Generic systems and software vendors must team with local market segment specialists to develop and promote these applications.



8 Selection criteria and methodology

8.1 Selection process methodology

The vendor selection process for a Content Capture and Processing solution starts with analyzing and describing the broader strategy. The Content Capture and Processing strategy is a derivative of and must support the business goals. The purpose of starting on such a high level is to avoid having a too much of a focus on tactical issues only. Even when short term enhancements are achieved by implementing point solutions and standalone software components, which can result in a productivity/efficiency enhancement and probably a cost saving, but they don't contribute to the achievement of the business goals.

The business goals and Content Capture strategy should describe the goals of the "transformation" of the mailroom and workflow process. The transformation, from a manual labor intensive mailroom and document handling process, to an automated and fully digitalized mailroom, which routes the digital documents automatically to the business systems for retrieval and archive. This process contributes to the business goals and process optimization.

Higher business efficiency and 24-7 accurate availability of data as well process automation can be achieved by enabling automated incoming document capture and processing capability. The suppliers/external organisation can both deliver their documents electronically or in printed format; which will e-recognized, classified and routed automatically to the relevant location of the business system.

The support of the "Going Green" strategy can be done through both internal and external agreements to deliver documents as much as possible in a digital format, as well the internal policy not to copy documents but look for information into the business systems.

Overall cost savings like labour intensive data entry, invoice management, controlling and archiving as well a much better data/content insight and management and error reduction can be achieved by enabling automated document capture processes.

Next to improvement of the data entry and admin processes, the data finally needs to be used for strategic and operational processes and decisions. One of the main goals is to get much more grip on the data to make a quicker business decision which can be your competitive benefit in sales and procurement. Regarding invoice management a better control of your cash flow is guaranteed.

After the definition of the business goals, the resulting automated document capture and processing strategy and the highlighting of those elements with an effect on the archiving and business system process, it's time to take a closer look on these document management processes itself. A possibility to analyze these business processes is through the use of a methodology like Lean DMAIC. Using such a structured methodology and the outcome, will highlight the current bottleneck and can be used to streamline the new processes.



A decision which needs to be taken is to what extent the new innovative solutions are deployed. Will they be a replacement, or partly replacement of an existing application or will it be the start of complete new document entry and management architecture. Implementing an innovative solution just as an enhancement is not advised. This will result in integration issues and will only solve a small piece and will not deliver the expected benefits. The choice to go for a new digital document entry and management strategy doesn't need to involve a radical change for hardware, software and business systems. A modular deployment is possible, but the end-goal is clearly defined how to be reached. Using existing components, the emphasis lies more in the deployment of technique to have a rapid gain in investment and results. By using new components and changing of old to new, the emphasis lies more in business functionality, long term results and a partnership with the vendor(s).

Another aspect which is usually not accounted for correctly is the investment budget of an automated document capture and process solution. The software and implementation costs are either underestimated or minimized due to previous hardware or software investments. This issue in the budgeting will result to tough (procurement) discussions with the vendors, but in the end (as seen by many examples) can only lead to not met expectations. Not all the needed functionality will be implemented, and additional functionality needed is only at high costs or the integration is not implemented.

It is possible to implement a document capture and processing solution for a couple of thousand Euros', in that case you talk about a small site. However this type of solution is not a true innovation as described in this report. The implementation of an automated document capture and processing solution, a digital mailroom or any of the other solutions usually has an investment which starts from €50.000,- when deployed at multiple sites, the investment can be over € 100.000,-

A solid ROI calculation is then a must to create the business case. Several vendors have those ROI tools available; sometimes as part of an initial assessment package to identify the current bottlenecks and potential savings. The ROI needs to be checked if it covers the full scope of the business process as defined in the Automated Document Capture and Processing strategy. The initial investment might be a high number, but it has to be seen in light of the overall business goals and the number of handled incoming documents.

An alternative in the purchase of the Automated Document Capture Management software might be an agreement with the vendor to price it on a pay per usage method. Every sheet, document, mail piece, invoice, etc, going through the automated process is charged at a fixed amount. This pricing mechanism is popular with the Business Process Outsourcing and Document Services vendors, but not yet widely adopted by the software industry. Outsourcing can also be considered as an option. Outsourcing gives the option of a fixed cost per month and a potential for contracted cost savings.

The initial selection process steps are given in Figure 11. After these steps and going through the questions and answers, the actual vendor selection process can start.

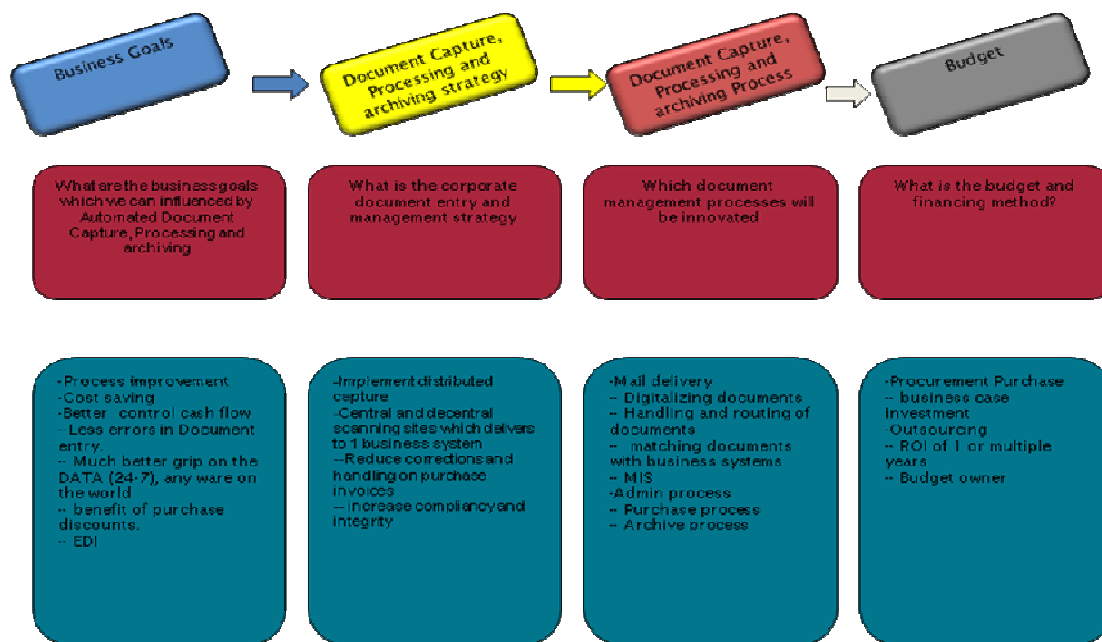


Figure 11 - Initial (vendor) selection process steps

The final result of the initial selection process steps is a strategy document that can be used to start the vendor selection process. It should form the base for the Service Level Agreement terms and conditions and the Key Performance Indicators.

8.2 Software

The software to support the Automated Document Capturing Management architecture comes in many shapes and sizes. It varies from "out of the box" software to manage a couple of tasks in the process to whole portfolio's / Modular systems which can covers the complete workflow and relevant tasks.

Some software is best deployed within a office environment; others are best equipped for traditional mailroom in a corporate environment. The list of software vendors that offers solutions within the Automated Document Capture Management is long. There are over 150 globally. Selecting the right vendor(s) or partner(s) is complex, labor intensive and many times results in a faulty deployment. The faulty deployment is due to the fact that the organization only invites the known global suppliers or local suppliers.

The usual approach is still the RFQ, RFI and RFP process. This is a valid approach, although the turnaround time is usually several months up to a year, before a first decision is made. The main reason it takes so long is because the project team will learn more and more during the RFQ, RFP process. The iterations in conversations with vendors, enhancements, to the RFP and the extensions of the project scope are more common in the project then absent. Unfortunately, once the decision has been made after a long period, the implementation is still struggling and has to conquer unexpected setbacks and overcome technical difficulties.



Most of these problems are still occurring due to an inadequate preparation process. The RFQ, RFI and RFP are sent out with some generic technical questions. The project team did not take the time (or had the right skills) to proper preparation from a business perspective. Not always the project team is complete to blame. The amount of information at quite complex and technical level from the magnitude of vendors isn't easy to digest. This makes the fall-back to the comfort zone easy. This report with innovative business solutions as well the vendor profiles is intended to overcome that problem for the project team.

In chapter 10 "Vendor profiles" a set of the European (or global vendors with a European presence) vendors are described that have a broad value proposition in automated document capture and processing management. They don't offer a niche or limited functional solution. The value proposition and portfolio suite covers a broad scope of the document capture and processing process. When the questions in previous paragraph are answered, the document capturing and processing strategy is created and the KPI's are defined, the next step in the selection process can be done. The next step involves the link between the requirements, wish list, preconditions, the solutions as presented in this report which will be implemented and the value propositions and solutions offered by the vendors.

The purpose of this report is not to promote one vendor as the best for every type of automated document capture, processing and archiving problem. There will also not be any conclusion that one vendor is better than the other. The final decision is still left to you. Which vendor fits best to my specific business problem I want to solve?

The methodology as described in this report enables the selection of a short-list of vendors that are best equipped to propose a solution for the business problem(s).

The creation of the short-list can be different for every type of organization and is specific to each business problem. From a marketing perspective every vendor tells you it can solve every problem. Usually this is not realistic. Each vendor has a specific focus on industries, business solutions or processes. When all the homework is done correctly and the vendor selection matrices as described in paragraph 11 are entered, two or three vendors have the best fit. It is advised that the next step with these vendors is a proof of concept. The document as the outcome of the initial selection process steps can be used to define the scope and criteria of the proof of concept. The proof of concept can be set to a three month period. This approach has a major turnaround benefit over the traditional RFQ-RFP approach.

To support the answering of the selection matrices and define the short-list of vendors the following questions should be answered.

What elements of the Automated Content Capture and Process architecture need to be covered?

- Document scanning
- OCR and ICR recognition
- Data capturing
- Data classification
- Data processing
- Data routing
- Document management (DMS)



- Enterprise content management (ECM)
- Enterprise resource planning (ERP)
- Archiving
- Management Information (MIS)

What will be the input formats the Automated Content Capture and Process solutions need to handle?

- Printed format
- XML
- PDF
- E-mail
- Fax
- Peer to peer

Which document input and workflow sources need to be integrated in the (new) mail and document management facility?

- Fax server
- E-mail server
- ERP system
- Production/MFD scanning system
- Archiving system
- Enterprise content management system
- EDI
- MIS

What are the biggest challenges your mail and document entry facility faces today?

- Fault sensitive
- Data management
- Do not have enough idea about the cash flow
- Labor intensive and expensive process
- Time consuming process
- No accurate management information

What is the current hardware and software infrastructure?

- Production scanners
- MFD with scanning and network facilities
- Mail servers
- Fax servers
- ERP system
- Document management system
- Enterprise content management system
- OCR-ICR module

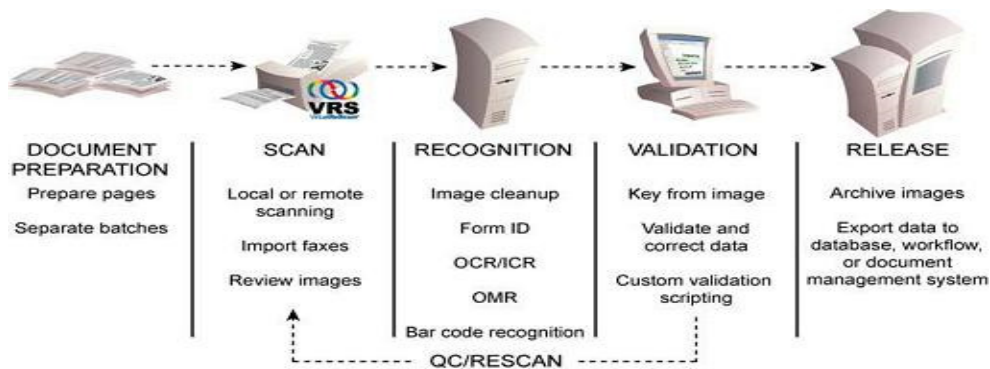


Figure 12 - Example of Automated Document Capture and Processing Application

After answering these questions and selecting the required options, it is possible to compare the requirements with the offered functionality of the vendors. Doing the cross-check will give an alternative to the outcome of the selection matrices.

8.3 Hardware

Hardware is another part of the automated document capturing, processing and archiving system. Many of the vendors in this area have a requirement list the hardware vendors have to comply with. The document scanners, no matter it is a MFD scanner or production scanner, have to deliver a high quality image. Via several tools this image can be optimized, and turned in a way the document capturing solution can recognize the data at a nearly 100% level.

The hardware elements that are determinant for the automated document capturing, processing and archiving architecture are;

- **Scanners**
 - Production scanners
 - MFD scanner
 - Flat-bed scanner
 - Different paper size scanners
 - Input tray capabilities
 - Speed
 - Color requirements
 - Imprint requirements
- **Computer server capacity**
 - Image enhancement
 - Document recognition
 - Document Classification
 - Storage
- **Workstation capacity**
 - Data entry stations
 - Single Point of Control
 - Management Information Reporting
 - Validation and control
- **Network**
 - Dedicated LAN network



The hardware configuration has to carefully taken in account regarding the selection process. You have to make sure it delivers high quality images, which can be handled in the capturing, processing and archiving system. The existing hardware configurations of the organizations can impose a lot of restrictions to the innovative business solution of choice. Due to the proprietary "standards " in managing and working with the different equipment, not all software applications are able to connect or integrate.

The vendors as described in this report can connect to multi-brand production scanners and MFD devices. Although care must be taken in the origin of the vendor and the level of connection offered. Pure software vendors usually focus only on market standards to connect to hardware components.

The existing or new hardware in scanning equipment must be carefully checked for integration capabilities to the overall Automated Document Capture Management solutions in file formats, remote control and automated image correction capabilities.



9 User Survey

9.1 Market Survey results

In conjunction with the creation of this report, Strategy Partners actively interviewed user organizations and vendors from a variety of industries. Discussions have been held with IT managers, managers of the mailroom, corporate service managers and financial managers/controllers. In addition to the face-to-face conversations and discussions an on-line survey has been used for online information gathering. The survey results are such that a comparison can be made between the vendors answering the questions and the organizations (users) to identify specific differences.

The persons interviewed and the respondents of the survey came from a variety of small companies to large (global) organizations. There was also selection based on their current infrastructure and status in the automated document capture and processing space. Some of them were well advanced and some of them still had basic tools in use. One of the main goals of this report is to identify the requirements and needs of those organizations who had not yet implemented newer tools. The combination of the opinion from novice and experienced users gives a good overview of where the market is going (or needs to go).

Organizations can benchmark themselves also better against their peers in the industry or market segment. It is not just against the well described early adopters, who have implemented the new hardware and software from the vendors. Vendors can adjust their strategy and product development based on the survey results and the differences in results between the vendor and the organizational answers. In the end that should deliver the benefits for both sides.

The results from the on-line survey of the investigated organizations; all organizations are qualified for inclusion in our analysis with a broad dispersal of participation across a variety of industries, from small to large customers. Most are either actively using distributed capture technologies or investigating the capabilities, technologies and vendors.

The survey participants are using solutions from a relatively or even a mix of the major players in the image and data capture market, listed in Chapter 10 "Vendor profiles". Large companies are well represented in the survey with the majority (59%) indicating they have 500 or more employees. Small and mid-sized organizations were not overlooked, however, with 19% reporting that they have between 100 – 500 employees and 13% with less than 50.

In Figure 13 European respondents comprised a well-balanced cross section of participants including finance (20%), government (18%), insurance (14%), health care (13%), education (9%), manufacturing (8%), Logistics (6%), retail (6%), and non-profit (6%). The leaders – finance, government, insurance and health care are, not surprisingly, from industries that are traditionally paper-intensive.

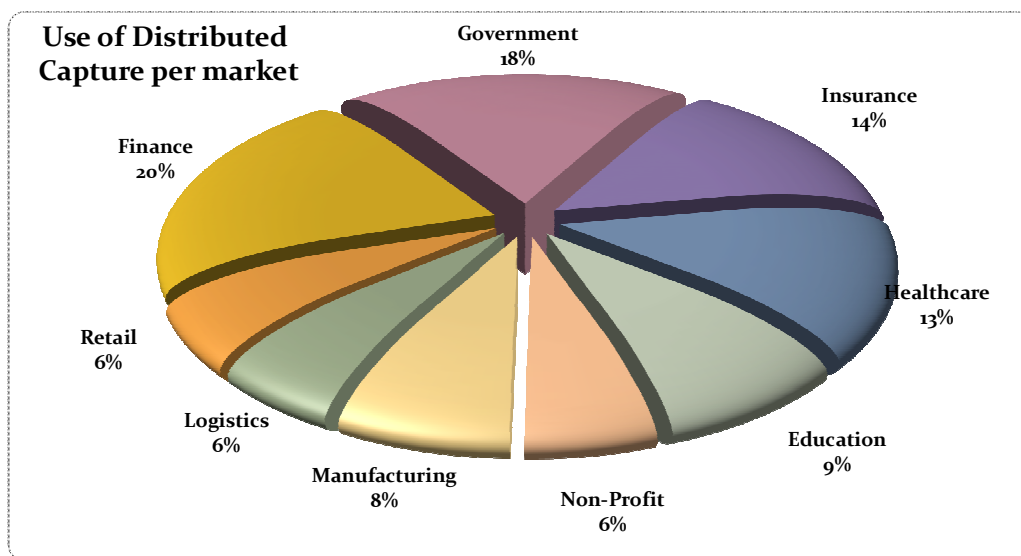


Figure 13 - Use of Distributed Capture per Market

Some highlights and trends that can be extracted from the survey findings, also in comparison with previous analysis, are for example:

- MFD use as document capture portal has grown from 34% in 2006 to 57% in 2009
- The use of fax servers for document capture dropped from 16% to 8%.
- Manual indexing has declined by 20% over the past three years.
- Automated forms processing (via OCR, etc) have doubled over the last two years.
- Document and data capture for Invoice processing (67%) is by far the most popular application
- Document capture for Archiving activities are mostly (93%) done as an external service project
- Vendor selection time has grown overall.
- Most decision-makers are middle management (92%).
- 71% feel vendor support meets their expectations.

Other more generic observation are mentioned below.

Distributed capture

Distributed capture solutions are being used in a wide variety of industries in both small and large document volumes. This approach has proven its worth for nearly all those who have implemented such a system.

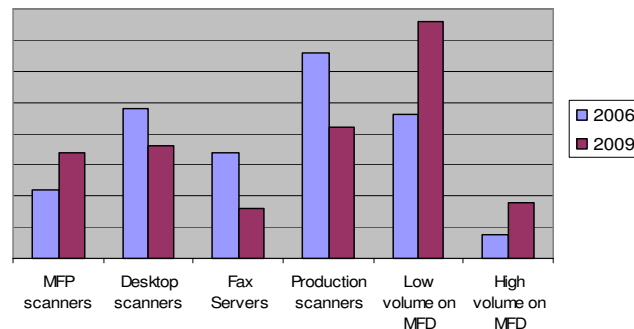


Figure 14 - Volume of scanning in distributed scanning configurations 2006-2009

In Figure 14 the use of scanning devices is illustrated in a distributed capture environment. The overall use of MFD's is on the rise, especially in low volume (up to 60,000 documents per year) and the very high volume applications (> 1,000,000 / year). A great number of organizations report that they are unable to calculate a quantitative benefit. This also because of a lack of "scan-click" measurements within the distributed capture solution. One of the reasons MIS systems are now added to the capturing and processing solutions to give a better insight in the results.

Key findings in Scanning Hardware - MFD's

As illustrated in Figure 15, the majority of respondents uses a mix of scanners and MFD hardware for distributed capture; 17% use desktop scanners, 18% use production scanners, and 33% use MFD's. A great number of organizations, nearly one-third, indicate a mix of scanners and MFD's are used to distribute scanning and capture across their facilities. Scan volumes confirm this approach with a total of 73% indicating scan volumes from both scanners and MFD's. A sizable portion, however (19%) use MFD's exclusively. Fax machines are still in use in many organizations as well (8%).

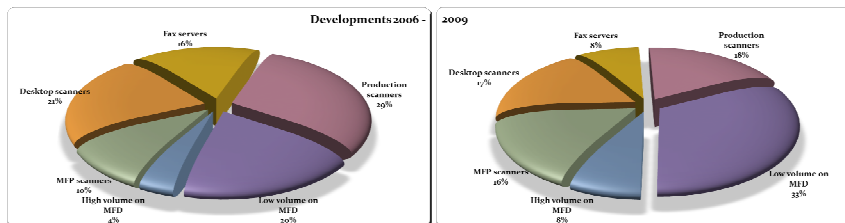


Figure 15 - Usage of scanning devices 2006 - 2009

Comparing data collected from a 2006 survey we see three years ago only 24% of organizations had MFD's in use whereas MFD usage has grown to 41% in 2009. While the number of organizations using desktop or production scanners is slightly decreasing over this period, the use of fax servers dropped from 16% in 2006 to 8% in 2009. This validates the general assumption in the industry that MFD's are replacing fax servers in many instances, primarily for low volume sites. Interesting to see is the move from Fax server solution suppliers to offer their solutions embedded in the MFD. 2009 Respondents indicate that 75% of low volume sites have MFD's versus only 19% in high volume applications.



Scanning of invoices

One of the most used document capture application is to support the electronic processing of invoice and purchase orders. It are the clear benefits of paper to image file conversion, advance document recognition and data extraction in conjunction with direct integration of the data with ERP applications that makes this the number one application. The market for invoice capture and processing software is under constant research from Strategy Partners. 2010 research data shows that in the Netherlands the market for this type of applications had an annual growth of 27% in number of installations. The research also showed a faster growth in the smaller document volume segment compared to the high volume document segment, as show in Figure 16. This for on premises installations. In the high volume implementation segment the trend is more towards Document Outsourcing or BPO outsourcing services.

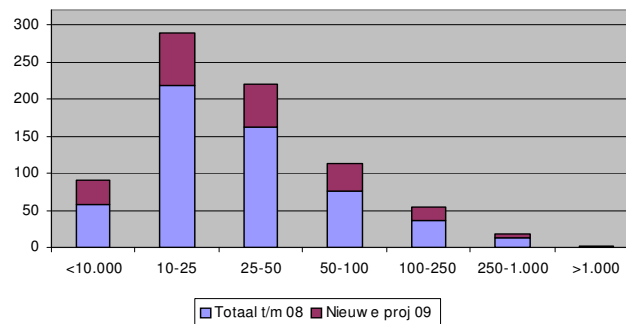


Figure 16 - Annual growth invoice projects in relation to document volumes

9.2 Users functional expectations

Next to the results of the on-line survey, Strategy Partners has spoken to various organizational representatives to have more in-depth discussion around various topics. The response is grouped and represented in following 5 categories:

- Automated document capture and mailroom versus the internal user
- Multiple incoming data streams
- Integrated automated document capture and processing to business systems from central (production) and decentralized departments and or remote offices.
- Return on investment calculation
- Solution knowledge

Automated document capture and mailroom versus the internal user

When looking at the innovation of the Mailroom and document capture process, do not forget about the customers of the document capture and mailroom. These customers, usually the internal departments and organizations have also a strategy about how they organize their business processes to be able to achieve their business goals. It sounds obvious that this have to be but the cases where it is not been done are many.

From an innovative perspective, there is a focus on enhancing the current processes in the document capture and mailroom. How can the current number of documents, invoices, volumes and formats processed into the organization and business system more efficiently. Reducing manual labor efforts, being able to



archive and retrieve data and documents fast, provide management information (MIS) to get much more grip on the data and entire process.

When looking at the survey results however the need for an automated distributed capture process is obvious and not to be ignored. Business owners who are responsible for the process have a good knowledge of the effect of up to date available data and information. The options and benefits of automated document scanning, capturing, classification, processing to ERP/business/ECM or document management systems are well understood. The innovation on the mailroom should focus on the internal customers, the internal business processes and its requirements as a primary direction for the innovation itself. An optimized process to deliver electronic documents when the organization wants printed delivery would be waste of money and time.

What are the requirements from internal users/departments of the mailroom and automated document capturing solutions, I.e. available on the MFD.

- What is the need for actual data and its availability?
- What are the requirements of a Distributed capturing and processing system?
- Is there a need for (remote) offices to have the mail and data much more accurate available?
- Is there a need to automate the existing manual workflow, the time consuming processes
- To optimize and connects easier and faster to the business system?

Multiple incoming document and data streams

One of the common problems heard was about organizations that had multiple incoming data streams and formats. To have a system which can handle all type of data streams , convert that in one format and distribute it into the business system was very complex, fault sensitive and from infrastructure point of view difficult to manage. Due to open standards and the trend to deliver a open architecture most current Automated document capturing solutions can handle both printed and electronic files like (PDF, e-mail attachments, XML, TXT, etc.)

As the document scanning and data capture process can take place both in the production-mailroom (digital mailroom) facility as well the office environment on MFD devices, all capturing and processing solutions needs to be connected to the business system. For the bulk incoming mail it usually will take place in the mailroom, for specific, (confidential, HRM) data it will take place in the office.

Based on the feedback during our survey we learned the biggest issue with automated document capturing and processing is if the system can only handle 1 data or format. Multiple data streams need to be handled, otherwise you have a manual and a digital system parallel to each other, which results in increased labor, time, and fault sensitive.

The good news is that both the production environments and office environments (MFD's) can be equipped with solutions which can handle all kind of data streams. The same time the routing processes and connectivity with business/ERP systems will be done more and more based on open standards.



Integrated automated document capture and processing

A demand was mentioned to have a tighter integration between the Automated Document capturing, classification, processing solution and ERP/DMC/ECM system. In the past these processes were differentiated and complex to integrate due to different formats and lack of standards. The scanning and capturing process (also called digitalizing of printed documents) was last 10 years mainly used for digital archiving. Since all document capturing solutions can be connected to routing/workflow solutions, (or have a routing capability integrated) all related processes and business systems can be connected.

As more and more organizations work with remote offices (retail, employment agencies etc.) the remote capturing function has been seen as an absolute must have. The same time the reverse benefit of a distributed capturing solution is the central reception of documents which can be delivered, "real-time" to the remote locations and employees.

More and more ERP systems provide connectors or routing and workflow modules to make it easy to get the data in their system. This trend stimulates the need for connectivity for both the Workflow software, capturing software as well the ERP suppliers. The feedback from both the vendors and customers is that this trend is fast developing the right direction.

When an organization seeks a solution that should handle multiple Data formats, make sure to verify the capabilities of the vendor and its solution.

- References where a similar deployment has been done.
- On site test to verify the sales story.
- Ask for a proof of concept with sample data.

Return on investment calculation

The return on investment calculation is a key element for a decision maker in selecting and implementing a new solution. With about 26% it has the highest score on the question of "What are the most important evaluation criteria in doing an investment in Automated Document Capturing and Processing". In further discussion with the decision makers of the organizations it became clear that a ROI is needed to support the business case to make the final recommendation and/or decision. The verification of the ROI is however seldom done. The ROI is not verified after a year. The ROI is used to support the actual business case but not used to manage the ongoing project implementation or during the managed services contract period.

Discussing the ROI itself is an interesting topic. The ROI had to be solid, tested and proven. Another important element of the ROI, it needs to be independent. An ROI tool as provided by a random vendor who is also keen to sell the solution is not always representative. The organization itself is not able to create a ROI that covers all the elements it needs.

The requirement of an organization regarding the ROI is that it will cover all the elements of the business process. It should encompass all elements of people, process and technology. If the software vendor is able to convince the organization that its ROI tool is covering or can cover the whole business process and takes into account all the elements, the organization is willing to use the tool.



Due to the usage of the tool during the proposal and decision stage it needs to be a simple tool that can be used within a short timeframe (hours) to deliver a practical result.

Solution knowledge

As indicated in the survey and research, one of the critical elements was that about 9% of the interviewed organizations didn't know what a automated Document capturing, processing, classification and archiving solution was or supposed to do. When asking this question to a generic AP audience this response was to be expected. But from a IT and mailroom audience, responding to the survey which is aligned with their daily business activities, rather strange.

When discussing the concept, the various solutions, the available technology and key vendors, it became apparent that most of the AP, financial and mailroom employees had no good or detailed knowledge. Most of the knowledge came from the hardware vendors (MFD) who wants to sell a new product and promote business/efficiency solutions around the new hardware. When specific (or independent) knowledge was needed by the organization the usual approach of internet searching, reading research reports and discussions with peers was the obvious route followed. Often the complaint was heard that after the initial hardware or software purchase was made the vendors went on to the next sale. An adequate support, during and after implementation, was rarely seen. That this leads to numerous problems after the initial implementation(s) is a reality.

As an organization in an orientation or vendor selection project, it is advised that the support not only during implementation phase, but also after the First year is discussed and agreed upon.

- Does the supplier have a user Group
- Are training sessions, seminars or webinars organized at a regular level?
- Is there a newsletter?
- How is the communication around patch releases and major releases?
- Is there a website for users with tips, hints, downloads etc.?



9.3 Benchmark implementations

9.3.1 Rijkswaterstaat

Rijkswaterstaat 'RWS' is a part of the Ministry of Transport, Road and Public Works and is responsible for managing the network of roads and waterways in the Netherlands. The mission of RWS provides implementing organization commissioned by the Minister of Transport, to manage and develop the national infrastructure networks.



Rijkswaterstaat

RWS is the administrator of the National road network (3260 km), the National Waterway Network (1686 km) and rural water system (65,250 km²). Daily RWS facilitates more than 6 million roadway users and thousands of ship motions on the main waterways. In addition, RWS actively works on protection systems to maintain the Netherlands in the 21st century regarding sea level rise and other effects of climate change.

For all these tasks and a well performance of them, RWS is organized into ten regional districts and five rural services. At the beginning of the 21st century RWS decided to get more grip on the organization by concentrating certain work processes and increasing production. In the period 2003-2007 a reorganization has been taken in which RWS has become an agency. This makes it possible for RWS to operate as a result, business and customer oriented organization. As part of this reorganization, RWS decided to remove all local business systems and replace it with one central organized maintained business system SAP. This reorganization resulted in process improvement, and the number of information systems reduced significantly.

As RWS is a governmental organization it usually does not send invoices, but as one of the largest tender and contracting authority it receives a large amount invoices. Therefore, it is understandable RWS will focus on the constant improvement of their internal AP process also called 'The digital Purchase file.'

The most important targets of the projects are the reorganization of the liability management and professionalizing of the purchase process. Parallel benefits are a better capture of centralize information management and improving ICT support, which results in an overall better process management. Another benefit of the 'The digital Purchase file' is that the contracts are not unattended anymore but for every relevant staff, digital available, which benefit remote -flexible work locations and makes it easier to share information between colleagues.

The project set up

To make sure the implementation was done smoothly, each decentralized organization had its own project team, which linked to the central coordinated project team.

By involving the employees in an early stage, the final users are much more committed to make the implementation to a success, as they finally have to work with the solution.

The central project team divided into several aspects:

1. Implementation coordination;
2. Conversion;



3. Engineering;
4. Functional design;
5. Communication, Change & Training.

Each aspect focuses on a specific part of the implementation.

The full implementation was roughly divided into four phases:

1. Preparation (about four months)
2. Go live in the purchasing department (up to two months)
3. Go live the rest of the service (three months)
4. Optimization (four months)

In the SAP module PSRM, all contractual documents are digitized and grouped - saved per contract. Printed documents will be automatically scanned, captured, classified and processed in the right project file. Within these files, links are created with all the active modules of SAP, such as procurement (financial liability) and the Project module.

The previous/old contract register RWS (CONSYS) was converted into SAP, as soon as the new solution went live. Relevant documents, like bids, communication, etc. can be now both digital or in printed format scanned, captured and (via project numbers) recognized, to be processed to the SAP system. Finally creating a one-to-one link with the Purchase order/project number.

Other benefits the organization get by using the PSRM system are process oriented. The management of internal digital approval flows, such as contract documents. The advantages are: less paper document flows, considerably shorter lead-time and an "audit trail". The latter means that it is always possible to look into the system who did what and when in which project. The main condition of effective use is that all stakeholders have to work in the same system in order to get the benefits of the system.

Example. The project owner organizes a tender and received the relevant bids. He approves one bid, with ok of the budget holder/controller, as well an OK of the director. All different approvals are filed and connected to the project number and a purchase order. Both the project number, purchase order and project owner will be filed in the system.

The contractor delivers the job, and the inspector communicates to the Project owner the job is OK and finished. The project owner place an OK in the system, the project is finished and OK.

The contractor sends a printed invoice and contractor delivery form, which will be scanned, captured, classified, and recognized. The SAP module PSRM matches automatically the project number, contractor's number in the system. When these data is OK, the circular starts with sending an e-mail to the project owner who signs off, the budget holder who also signs off and the director who have to sign off for final approval. In less than 1 hour of receiving the invoice and related documents, the contractor have the amount on his account. The way RWS handles purchase invoices within their complex organization, delivers several benefits. The contractor receives his money as soon as he delivers a correct job. RWS does not have to deal with time and labor intensive route and prevent their organization from costly errors.



As RWS did an in depth project preparation, RWS wants to make sure, via the project teams, the organization is well trained. Thus to make sure the conversion of the old system to the new system went smoothly, the employees feel confident to work in the new system, the external and internal contractors/organization is well informed.

Strategy Partners discussed and investigated the Document capturing, classifying and processing solution, however we were also interested in the way RWS organized the project set/up, implementation and connection with the business system, in this case SAP. Since the implementation the employees are always able to connect to the system, even if they work remotely via their black berries, to make sure the process continues, and there is always access to the data

9.3.2 COOP



Coop has over 200 members/supermarkets in the Netherlands. Their central service office is based in Velp where the AP (Accounts Payable) department is located. Annually over 1 million invoices have to be handled and processed into their SAP business system.

The most important reason to optimize their invoice process is the safe circulation, better and efficient interaction between purchase organisation and decreased cost of invoice handling.

These new processes have to meet a number of requirements.

- Fast and accurate handling of invoices
- The process should ensure a fast processing, booking and payment of all incoming invoices from one integrated system.

Before investigating new solutions, suppliers and technical options, COOP worked with a old software system, which was not integrated with their Purchasing department and ERP system. This resulted in a lot of manual and fault sensitive processes.

After COOP chooses for their ERP solution SAP, it was a must that the new document capturing solution should be able to integrate with SAP. After careful investigation and consulting their ERP supplier COOP selected ReadSoft ERP integration for SAP.

One year before the implementation COOP started with the preparation of their invoice automation. The Financial team was organized as a project team to optimize their purchasing process. By involving the employees of the AP and Purchasing department, in one project team, is the foundation of the implementation success.

All incoming invoices have to be opened, sorted scanned, verified and archived. The information will be transferred to the SAP system to be booked and controlled.

The document capture, classifying and processing solution of ReadSoft captures the information, classifies it and matched it with the purchase orders. The same time ReadSoft automate the allocation and streamlines the approval, both, routine as well as exceptions. Thanks to this optimized process, all incoming invoices, over 20.000 per week are booked in the business system the same day.

COOP wants to achieve a complete digital system, a Full digital process of document entry to payment. Invoices enter COOP in all kind of formats, 92% in



digital format, 8% in printed format. COOP required a process that prevents errors to occur in the input and approval process.

A process that also allowed COOP to process all invoices automatically.

With this new automated process COOP can handle and route all purchase and cost invoices in SAP with minimal or no manual intervention. No matter what kind of format: paper or iDoc/EDI (electronic invoices).

During the implementation COOP has faced a number of challenges, like processing of different VAT rates, processing of debit and credit amounts on an invoice, packaging processing, EAN code processing, processing of return goods and discovering of price differences between orders and invoices.

The financial team was very pleased with the ease of use to process invoices into the system. Moreover, to retrieve the electronic image of the invoice easily from the archive

9.3.3 Scrutton Brand

Scrutton Bland is an accountancy practice with one hundred and sixty employees and offices in Ipswich and Colchester. The organization offers a wide range of services, including traditional accountancy services as well as more innovative business advisory and development services. The company also includes Independent Financial Advisers and Insurance Brokers.



Scrutton Bland encountered several problems managing their incoming post because they would sort it before putting it on the Document Management System. The process made it difficult to find on the server and there was often a delay between the time a piece of post was received and getting it to the person who needed to act upon it. In addition, incoming post could easily get misplaced. Clients called wanting immediate responses on things such as their tax returns, but this was difficult to do instantly with the old system as documents couldn't be retrieved quickly. Scrutton Bland also had space and storage issues with the amount of paper files taking up space and wanted a solution that meant they could do away with paper files altogether.

The Document Capturing and processing solution improves the incoming mail distribution workflow considerably. They can now scan the post as soon as it arrives in the morning. This ensures there is an audit trail on the post immediately and avoids documents getting misplaced. Scrutton Bland needed a solution to fit into their existing Document Management System Interwoven WorkSite which could easily be done with Document Capturing and processing and connects to Interwoven WorkSite. This has enabled paper documents to be easily transferred to electronic documents and delivered to any individuals' PC in the shortest possible time. The new system is very easy to use since anyone can scan the post in, allocate it, and press send to lodge it into the Document Management System where it can't be misplaced. All the staff can use it rather than just the support staff which has speeded up internal processes greatly.

For variety of reasons SCRUTTON BLAND'S decided to implement eCopyShareScan and eCopy Connector as its new document capture, processing and archiving solution on the same platform on which the existing Document Management System Interwoven WorkSite is running.



By integrating the Automated Document capturing solution (e-copy) with Scrutton Bland existing Document Management System, locating documents is easy by the creation of individual customer files that are easily retrieved from any workstation.

Now when a client calls with a query on their taxreturn, Scrutton Bland can instantly search their document history. They have also been able to give clients access to their own directories so they can view their own postal trail and tax returns. This has speeded up business processes and improved customer service levels. The solution has also enabled Scrutton Bland to back-scan all their old paper files which were created before the implementation of a Document Management System. They have been able to reduce their paper usage and get more functionality out of e-mail by using this as their method of document delivery rather than the postal system. The cost savings for Scrutton Bland have proved substantial in both labor and time. The solution helps to reduce the amount of staff required to sort post and speeds up communication and responses to incoming mail.

9.3.4 Sample implementations

Account Opening

Achieve time savings of up to 80% and maintain high data quality by automating the account opening process and eliminating manual paper handling and distribution. Achieve time savings of up to 80% and maintain high data quality by automating the account opening process and eliminating manual paper handling and distribution.

New account applications require a variety of supporting documents in both paper and electronic forms. The automated document capture management solution enables employees at the branch or in customer service centers to automatically capture all relevant documents from their customers, validate them and send them to back end systems for immediate processing. This allows customer facing employees to spend higher value time with their customers, improve the service experience, and close more business faster.



- Required documents such as ID cards, application forms, proofs of residence and proofs of employment can be captured via a scanner or MFD at the branch or at the customer service center at high quality and routed to the back end for further processing.
- The documents are automatically classified, and metadata is extracted and validated to ensure fast availability of high quality data at the front and back end.
- If any data is missing or incorrect, an automated alert function triggers exception handling and correction. Customers and bank employees can trust that only complete and correct data is sent to the back office, ensuring high data quality and processing efficiency.
- Upon completion of the account application, customers can be notified about the status automatically via paper, fax, email or SMS. These same communication channels can also be used to promote additional products and services to generate more business – and a more positive customer experience.



- Organizations can expand their customer services even further by using the same platform to broadcast information and new offerings to their customer base or segments of it.
- The intake of all critical customer data and its flow throughout the entire organization is traceable and auditable from scan to final archive, improving regulatory compliance.

Successes:

- Digitizing new account applications across its 480 branch offices and submitting them to headquarters electronically helps an investment firm save \$1 million on overnight shipping alone.
- A bank tripled new business closings by automating the capture process and linking real time data capture with product experts and branch personnel.

New account applications require a variety of supporting documents in both paper and electronic forms. The Kofax enterprise capture platform enables employees at the branch or in customer service centers to automatically capture all relevant documents from their customers, validate them and send them to back end systems for immediate processing. This allows customer facing employees to spend higher value time with their customers, improve the service experience, and close more business faster.

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- A bank tripled new business closings by automating the capture process and linking real time data capture with product experts and branch personnel.



Loan / Mortgage Processing

Optimize the loan origination process – from application to qualification and approval – by capturing and validating documents and releasing them into backend systems. Risk management and regulatory compliance are increasingly critical, making the transparent and auditable capture of all required documents into an organization mandatory.



- All required documents and forms can be captured via a scanner or MFD at the branch at high quality and routed to the back end for further processing. Multi-page documents can be separated automatically, saving employees from manual sorting tasks.
- All documents and forms are classified, and metadata is extracted and validated. If any data is missing or incorrect, an automated alert function triggers exception handling and correction. Customers and bank employees can trust that only complete and correct data are sent to the back office, ensuring high data quality and processing efficiency.
- Customers can be notified automatically about missing documents or signatures, loan approval or any other status update via paper, fax, email, SMS or voicemail.
- The initiation of straight-through processing of data and business decisions based on bank specific rules and knowledge bases improves process efficiency and ensures compliance along the entire loan lifecycle – from origination and approval to auditing or resale.
- The same platform can be used to promote further offerings and services to generate more business – and positive customer experience. It can be used for customer specific communication and also for broadcasting messages and information to an entire customer segment to turn customer experience into more business.
- The intake of critical customer data and its flow throughout the entire organization is traceable and auditable from scan to final archive.

Successes:

- A financial institution processing 30,000 loans per month achieved savings of €4.32 million per year, improving customer service at the same time.
- A real estate investment firm inputs data into its SAP records management system 50% faster than before.
- A credit union increased its scanning volume from 20,000 to 115,000 per month with no increase in staff.

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- A credit union increased its scanning volume from 20,000 to 115,000 per month with no increase in staff.

Funds Processing

Reduce risk and streamline the processing of funds orders received via fax by capturing all related documents at the point of entry. A viable alternative to SWIFT. Success in funds processing depends on real-time transaction processing. But today, only 50% of transactions are handled completely electronically. The remaining 50% are still processed via fax. To close this gap, investment banks need a secure and reliable way to capture funds orders at the point of entry and process them in a timely manner.



- Based on the Automated Document Capture Management platform, the process from the receipt of a funds order by fax, to the confirmation of the trade order can be automated, with a full audit trail to fulfill security, compliance and quality standards.
- Instead of employees typing data from faxed orders manually, risking delays and errors, the platform captures faxed trade documents automatically at the point of entry.
- The messages are automatically classified (e.g. SWIFT message type MT402, MT509, MT515), and then key information such as the ISIN number is extracted and validated to ensure that only correct and complete orders are processed.
- Required data is converted and released into SWIFT (ISO 15022, ISO2022, or any other XML format) before the confirmation of the trade order is sent (MT502, MT509, MT515, etc.).
- This automated process increases process accuracy and efficiency and significantly reduces cost and risk.



Successes:

- A major European bank reduced processing time by 50%, and at the same time increased data accuracy and processing accuracy.
- A global investment bank achieved annual savings of \$500,000 and compliance at the same time with straight through fax processing of funds. Success in funds processing depends on real-time transaction processing. But today, only 50% of transactions are handled completely electronically. The remaining 50% are still processed via fax. To close this gap, investment banks need a secure and reliable way to capture funds orders at the point of entry and process them in a timely manner.
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- This automated process increases process accuracy and efficiency and significantly reduces cost and risk.

Credit Card Application Processing

Accelerate the application process while maintaining compliance by automatically capturing, classifying and extracting information from credit card application forms. Financial Service organizations are aggressively competing for market share on new products like credit cards. Proper risk management and regulatory compliance are as important as the ability to promote and process new products faster than the competition. With each new product and vendor, the forms used in the application process are changing; it is crucial for financial institutions to adapt as fast as possible.



- The same platform that automates the processing of new accounts, loans, mortgages and funds can also be used to process product offerings like credit cards.

The self-learning technology behind these platforms immediately adapts to new forms, classifies them, and extracts and validates relevant information before sending it to the back end for final processing.

- A major European bank reduced processing time by 50%, and at the same time increased data accuracy and processing accuracy.

A global investment bank achieved annual savings of \$500,000 and compliance at the same time with straight through fax processing of funds



10 Vendor profiles

10.1 Market overview

The market for Content Capture and Processing solutions is made up of a lot of small and large vendors, which doesn't make it easy to understand. The total number of software vendors in North America and Europe can easily run into the hundreds. The market in Europe is still wide and divers with a number of probably some 50 to 60 vendors. This already takes into account that only those vendors, who have a European reach and fall within the domain of Capture and Processing, are counted for.. There are a lot of niche vendors focusing on just a part of the Content Capture and Processing. The vendors in areas of image enhancement, specific OCR or ICR engines, wide format scanning or SOHO type of applications are not taken into account in this report. They would fall outside the scope of providing a solution for a total business application issue in the Content Capture and Processing.

Most of the vendors in the area of Content Capture and Processing, promise through their marketing that they can solve most or all of the issues in the document capture and processing environment and bring major business benefits. When spending more time with the vendors, it becomes clear they do have overlap with all the others, and delivers just a part of the whole workflow or do not have a solution for a specific business need. The profiling of a specific set of vendors in this report combined with selection matrices should overcome that problem for most IT and Facility Management managers.

The vendors as presented in the following vendor profiles are selected on the following criteria:

- Multiple implementations done in Europe
- Sales and support organization in Europe
- Recognized as a key supplier in the Content Capture and Processing space through number of references, corporate history, brand and revenues.
- Independence to any specific hardware and/or software brands.
- Can cover (nearly) the scope of the full Automated Content Capture and Processing functionality.

The vendor profile is aligned with a standard procedure, approach and structure to be able to compare the different vendors. With every vendor an extensive session has been held to analyze the functionality of the products offered. A lot of attention and discussion has been given to the business applications and the added value. The vendors will not be compared based on the (technical) features and functions as offered. At the end of the vendor profiles a comparison will be done based on functionality and value offered in specific business areas.

The structure of each vendor profile is according to the following format:

- Introduction – a short introduction of the vendor
- Contact information – name, address and additional contact information of the vendor in Europe and global organizational information
- Background information – a further introduction of the vendor, with its history, organizational structure, sales approach and the global mission.
- Products – the delivered products (in Europe) and its specifications
- Business applications – what are the specific business applications as can be offered by the vendor based on the products.



- Go to market – sales channels, partners and resellers of the products. What are the top 10 world/EU wide references, the number of European implementations and a few reference descriptions?
- Summary – what are the strengths of the vendor, the products and the business applications? Deployment recommendations by Strategy Partners.

Seven vendors will be described in the next paragraphs. They are recognized as the key vendors within the area of Automated Content Scanning and Processing Management, and apply to the criteria as described above.

1. ABBYY
2. KOFAX
3. MEDIUS
4. NSI
5. NUANCE
6. READSOFT
7. RICOH



10.2 ABBYY



10.2.1 Introduction

ABBYY is a provider of document conversion, data capture, and linguistic software and offers additional services. The key areas of ABBYY's research and development include document recognition and linguistic technologies. ABBYY's mission is to improve the quality of life by developing artificial intelligence technologies for efficiently capturing, translating, and transforming information into accessible and useful knowledge.

ABBYY offers product lines and services focused in the following areas OCR, PDF and Document Conversion (FineReader, Recognition Server, FineReader Engine), Data Capture (FlexiCapture) but also offers Mobile Products, Translation Tools, Dictionary and Reference Software and also Language Services. In this vendor profile, ABBYY's Data Capture products for processing different documents types and extracting data for backend transactional processes will be explained more in detail

10.2.2 Contact Information

Contact information Headquarter	Contact information Europe
Name : ABBYY HQ	Name : ABBYY Europe
Address : P.O. Box #201	Address : Elsenheimerstrasse 49
Zip code : 127273	Zip code : 80687
City : Moscow	City : Munich
Country : Russia	Country : Germany
Telephone : +7 (495) 783 3700	Telephone : +49 89 511 159 0
Fax : +7 (495) 783 2663	Fax : +49 89 511 159 59
e-mail : office@abbyy.com	e-mail : sales_eu@abbyy.com
	support_eu@abbyy.com
Website : http://www.abbyy.com/	Website : http://www.abbyy.com/
	http://www.abbyy.ru/



Company Information	
Headquarters	Moscow, Russia
Established (date)	1989 as "BIT Software"
Offices and locations	9 offices, Russia, Germany, the United States, Ukraine, the UK, Cyprus, Japan and Taiwan. ABBYY has a sales and distribution network in over 25 countries worldwide and over 350 partners in the data and document Capture industry. Number of employees more than 800 worldwide. More than 300 are directly involved in the development of the ABBYY products.



10.2.3 Background information

David Yang founded ABBYY in 1989. While he was looking up words in a bulky dictionary, during his French lessons, he imagined an easy-to-use tool that would allow people to translate words in just a few seconds. This dictionary application later became the first ABBYY product: ABBYY Lingvo, a software dictionary that is now a popular brand in Russia

In 1993, ABBYY released its first products for recognition and capture which included the now widely known ABBYY FineReader optical character recognition (OCR) document conversion application. Based on Finereader, ABBYY developed FormReader system for data capture (later evolved into the FlexiCapture product line). Over time, it also made its core technology available for license via a software development kit (SDK) known as FineReader Engine. Via these products, ABBYY has established a leading position in providing core recognition technologies, which are fueling leading Enterprise Content Management (ECM), Document Management (DM) and other systems using capture, and conversion technologies.

ABBYY began to expand their business outside of Russia starting in 1997 through an international distribution network and partnerships with Hardware/scanning vendors. To expand their distribution channel, ABBYY started with international offices and certified partners. Via these channels, ABBYY delivers its product portfolio with support for new products and areas.

ABBYY Europe, based in Munich, Germany, which is the headquarter of the sales and marketing office for Western Europe, has 60 staff-employees within their direct organization. ABBYY Europe also has an affiliated office ABBYY UK Limited, based outside of London in Bracknell, UK. Additionally there are in-country sales teams located through Western Europe including France, Belgium, Spain, and Italy.

ABBYY FlexiCapture products are sold through a network of certified solution partners, which includes resellers, and value added resellers (VARs), system integrators, consultancies and service organizations. These partners are supported through a Partner Program, which includes sales and marketing support, technical training and certification programmers.

FlexiCapture is available in a flexible licensing scheme. FlexiCapture Distributed is delivered on a page per year licensing model. A page-limited license grants the right to process a given amount of pages within a designated timeframe in yearly increments. Add on can be purchased for searchable PDF/A, specific language support (double bite) and connectors to the leading business/ERP systems. FlexiCapture Distributed includes a one-year subscription for support, maintenance and upgrade assurance (SMUA). After the first year, SMUA has to be renewed, in order to receive updates and new versions of the product.



10.2.4 Product descriptions

Data on paper can be very difficult to capture. Even in the best cases, in which the original documents have been designed for data capture, a single may turn a data capture project into a very complicated task. Very often, the tools that are available in the traditional data capture environments are not flexible enough to solve a particular task, or they require solutions that are complicated, expensive or difficult to use and maintain.

After many years of working with companies, processing a variety of semi-structured forms, and a long history in delivering OCR Technologies, ABBYY has developed FlexiCapture, a platform that enables the capture of data from fixed forms, structured and semi-structured documents including powerful intelligent document recognition (IDR) technology.

The FlexiCapture platform is based on ABBYY's core recognition and capture technologies and integrates its optical character recognition (OCR – machine print), intelligent character recognition (ICR- handprint), OMR (mark recognition) and barcode recognition as well as ABBYY's document analysis and image pre-processing technologies. The figure below illustrates a document classification scenario of FlexiCapture 9. As described the solution can be applied as a single entry point for the company's documents; any type of documents can be captured, separated, classified and recognized.



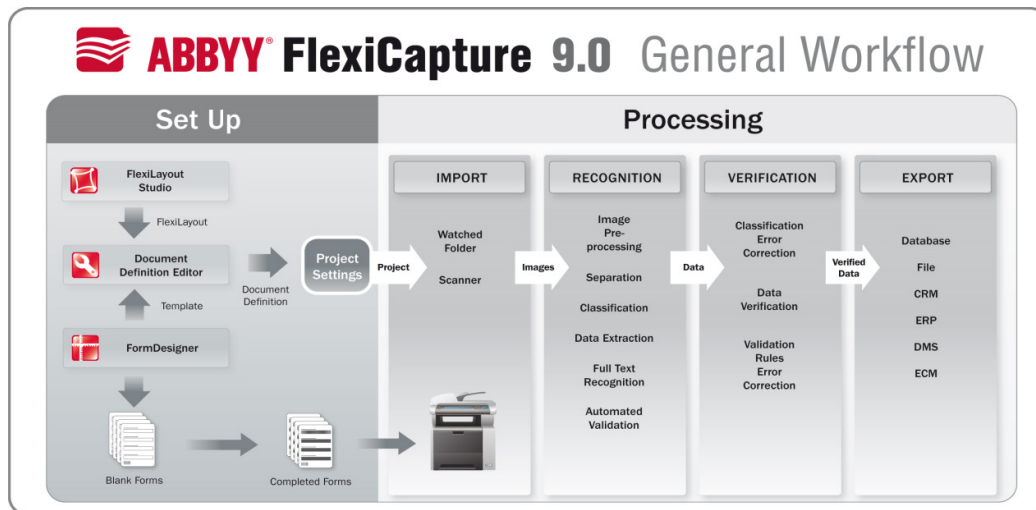
The power of the ABBYY FlexiCapture platform lies in ABBYY's powerful IDR technology to handle and process every kind of document from one - to multi-page with complex structure within a single stream. The FlexiCapture IDR technology, which is based on the concept of a "FlexiLayout" (described later), uses a flexible and intelligent document definition. This technology supports the ability to locate and extract key field data even when the field location varies from document to document.

ABBYY Data Capture platform is available in the following variants:

- ABBYY FlexiCapture Standalone
- ABBYY FlexiCapture Distributed
- ABBYY FlexiCapture Server

Customers who need the flexibility to integrate Data Capture technology into their existing DMS or ECM application can use ABBYY FlexiCapture Engine SDK.

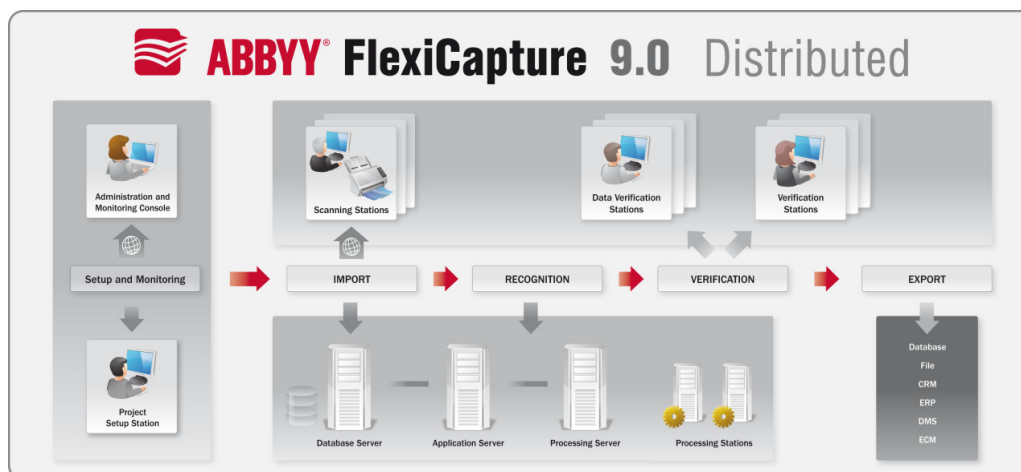
The next diagram outlines the general workflow process of FlexiCapture 9.0 from Project and document definition setup, via processing to the export of the data into any backend system.



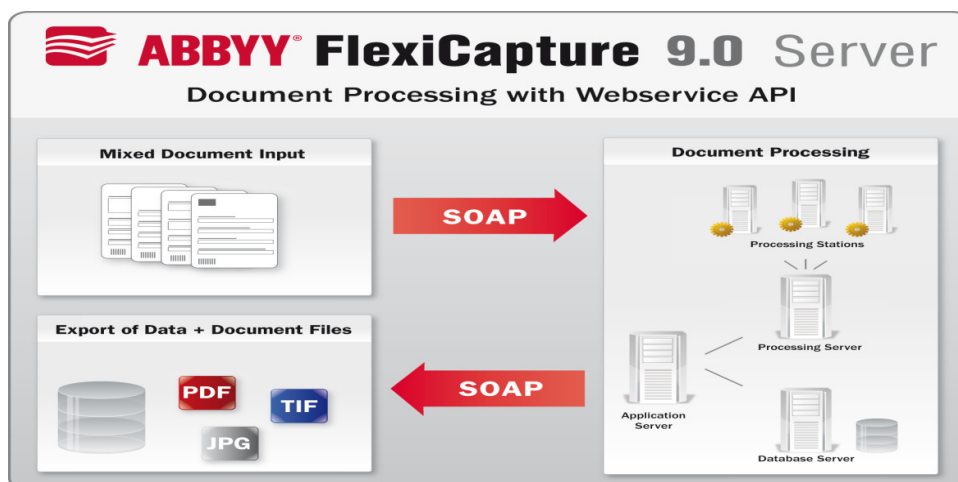
FlexiCapture 9.0 can serve a wide range of throughput needs starting from small-to-medium businesses and departmental tasks to large globally operating enterprise and government projects where a distribution of the document capture process and high-volume throughput is required.

Depending on the project needs, FlexiCapture can be deployed in three different versions– Standalone, Distributed and Server edition. FlexiCapture Standalone is suitable for small businesses, which need to process low volumes on a single workstation managed by one person.

The Client/Server based version of FlexiCapture 9.0- Distributed, is suitable for large enterprises and government organizations. Multiple operators in multiple destinations (Distributed Capture) can manage the solution. The next figure illustrates a sample process of the Distributed version.



FlexiCapture 9.0 Server allows customers to use FlexiCapture as an automatic Data Capture platform, which integrates into any existing workflow. FlexiCapture 9.0 allows automatic data extraction from any type of document and integrates via its Web Server API into existing customer workflows.



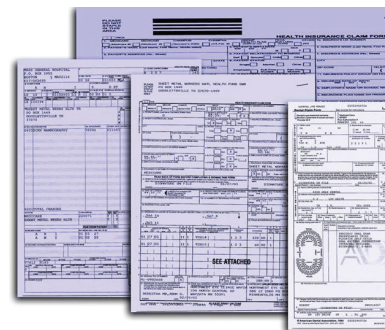
All three, Standalone, Distributed and Server can process not only fixed forms but also semi- and unstructured documents in the application. In above figure it is illustrated how the server handles the document input and communicates with the processing server.

FlexiCapture 9.0 can be used in organizations, which have the following requirements:

- Need a platform to process fixed forms collected from different sources
- Have to capture data from any documents, such as contracts, invoices or letters.
- Have to develop a customized invoice processing application

How does FlexiCapture IDR work:

In theory, capturing data from documents seems to be a relatively easy task. Even from semi-structured documents, there appears to be no major problems at first glance. The platform seems quite simple: find anchor objects for the fields, detect these objects based on content, and then easily locate the adjacent fields, which have to be captured. In practice, the situation can be much more complicated. For instance, if the anchor object is a text string, then it is quite possible that the text is not perfectly readable and that the OCR engine will capture only a part of the text, or the captured text will contain some mistakes, lines or stripes. The advantage of the FlexiCapture platform is that its intelligent document recognition (IDR) model works despite such variations.



FlexiCapture integrates seamlessly with ABBYY's OCR engine and intelligent IDR technology Flexi Layouts, the FlexiCapture technology for processing semi- and unstructured documents never relies on any fixed presumptions: The user may specify any object or its properties to be tentative. When using Flexi Layouts, a set of hypotheses based on rules provided during setup are developed, which then pick the best hypothesis for the whole set of objects on the page. This last point is important: the technology makes decisions not by analyzing each object separately, but instead, by taking into account the relationships between all the objects and the characteristics of each of the objects. Using this technology Flexi Layouts determine the best match for the whole set of objects.



FlexiCapture IDR engine internally matches the template type and locates the relevant areas. Both fixed form template and document definition for semi-structured and unstructured documents (flexible templates) which can applied to scanned documents providing fast and precise data extraction. Therefore, the amount of verification has been reduced versus manual data capture. ABBYY FlexiCapture 9.0 ensures the delivery of editable output formats like Excel, CSV etc., exceptional image recognition, accuracy and intelligent data capture.

Flexi layout – ABBYY’s Intelligent Document Recognition Technology

A Flexi Layout is a set of elements and their logical descriptions organized in a tree-like structure. See Fig. 9.7.6. An element is a set of distinguishing characteristics of a specific object on the document that may consist of one or several pages. When the Flexi Layout matches against a particular page, elements will correspond to objects on that page. As the same object on different pages could be different, and even may not exist on some pages, the element should be generic enough to cover all the possible variations of the object that it represents.

The steps in managing the Flexi layout are:

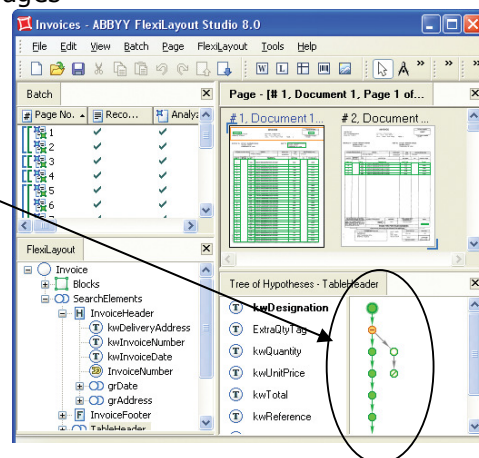
- Creating a project
- Defining the fields
- Defining search elements
- Defining elements properties.

When the Flexi Layout matched, the system tries different scenarios to establish a correspondence between the elements and the objects on the page. The correspondence is called a hypothesis. The hypothesis generated during the layout matching, are organized in a tree. This is because several hypotheses may exist for each element, and as hypotheses for all elements are interdependent, different hypotheses generated for the related elements. By analyzing the hypotheses tree, the developer can find the causes of errors that may occur during Flexi Layout matching, identify problems, and modify elements to improve the matching.

The main window, with sub windows of the Flexi Layout Studio is shown in the figure below.

- Batch window with the list of sample pages
- Flexi Layout window with the tree of Fields and Elements
- Matched Layout window with matched page images
- Tree showing hypotheses of selected page.

Within these steps, the Flexi Layout Studio user interface designed to simplify Flexi Layout creation by directing the developer through a set of dialog boxes. In complicated cases requiring more detailed customization and assistance, FlexiLayout Studio provides direct access to its internal language for greater flexibility and control. Each properties dialog box contains an “Advanced” tab, where you may directly specify any additional relations or properties using the Flexi Layout structural language.



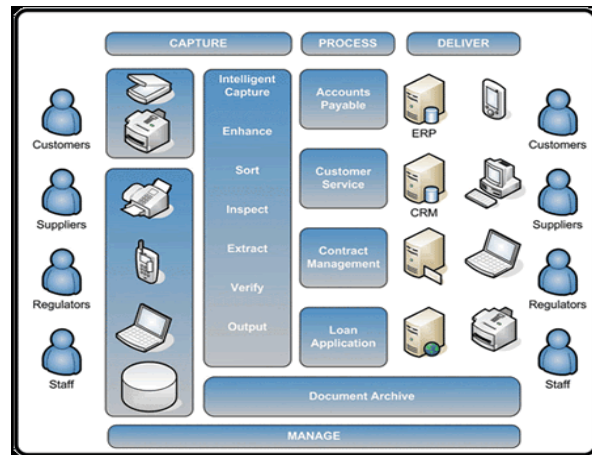


10.2.5 Business applications

Application: The Digital Mailroom

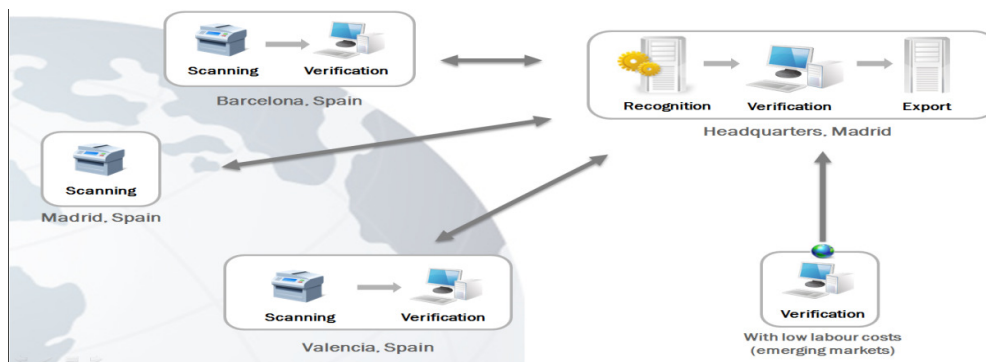
Managing customer correspondence is a critical part of any business and can become complex in large organizations with thousands of customers. In order to retain increasingly different and demanding needs, it is important to remain focused and provide timely, precise, and adequate responses.

As mentioned earlier in this report, scanning, capturing and processing solutions often applied within the digital mailroom to provide one corporate entry point for all incoming business documents. The distribution and handling/processing of incoming mail is a time consuming task. Handling incoming customer mail is most of the times done manually. When an enterprise has multiple sites, each operating site is responsible for dealing with its own mail. Depending on its content, the mail will be processed on site or forwarded to another location; which is better equipped to deal with the specific customer request. Mail processing could take anywhere up to 15 days. This policy not only involved frequent and numerous transfers of mail between various sites, it precluded the overall monitoring of all mail.



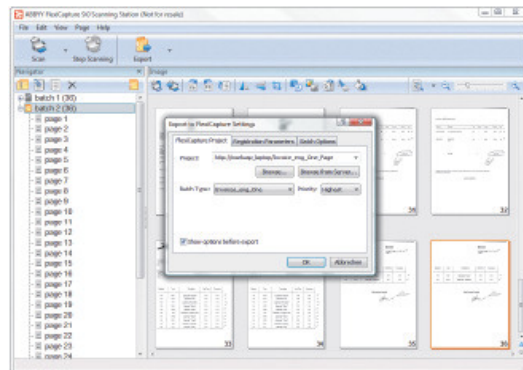
FlexiCapture in a digital mailroom scenario:

FlexiCapture 9.0 manages the capture and processing of specific business critical information from various paper-based document types (incoming mail, faxes and other) and classifies, sorts, and distributes the digital document to the appropriate destination within the enterprise. In a more advanced workflow, the captured Information can be extracted and - based on the business rules- exported to a database or used to start an automated workflow. At the same time, the documents and the extracted data will be available for the business or any other legacy systems. The Digital Mailroom becomes the bridge between hard copy and electronic documents, enabling common processes.

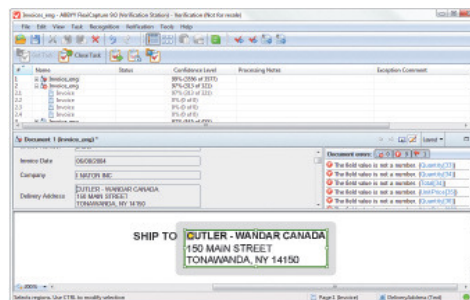




FlexiCapture 9.0 manages import, scanning, recognition, and export or routing of the documents in the capture process in the digital mailroom. The Capture platform ABBYY FlexiCapture 9.0 is the central application in that process: either scanned documents will be delivered to a hot folder and imported into FlexiCapture, or the Scanning Station of FlexiCapture can be used for attaching it to any available scanner and sending the documents directly into the right workflow in FlexiCapture 9.0. The documents are recognized with the OCR technology. In addition, the 1- or 2D barcodes as well checkmarks are recognized. FlexiCapture shows its strength especially during document classification, where documents of different types (invoices, contracts, insurance claims) can be processed in one single capture stream and then be classified into different document types. This streamlines the document recognition and efficient data extraction. After the recognition, FlexiCapture 9.0 automatically applies a validation via validation rules or scripts. During the validation process, many errorless characters and data can correct. All data, which needs manual correction, is send to the verification process, to correct by the staff.



The data can be verified, checked and visually matched against the original data. If scanned documents contain errors, which cannot be correct during the verification process, those can be sent to an exception-queue and handled different. Documents, which not scanned in the correct order, can assemble manually in the Verification Station. FlexiCapture9's strength is its integration options into any backend application or workflow systems. Customers can use standard exporters to Docuware or Microsoft SharePoint but also via custom scripts, any other backend application can integrated into FlexiCapture. FlexiCapture easily integrates into backend business systems like DMS, ECM, ERP and CRM systems. Document images can be prepared for archiving when converting them to Searchable PDF/PDF-A. Redaction allows removing confidential or sensitive data from certain



Application: Document scanning of Montage documents

A mortgage bank with hundreds of offices has to process large volume of mortgage documents received per post. To optimize this process the Bank has to manage following challenges:

- Document classification is a manual operation, prone to error and time consuming
- Retrieving documents is difficult and also time consuming
- Overall timeline to process one mortgage application is too long
- Too many employees are required to handle these tasks

The Goal: To Increase operational efficiency, improve access to data and reduce labour costs



The situation: Mortgages are sold under different brands, largely through a network of independent brokers, and all of the associated paperwork generated is forwarded to the company's centralised team for processing.

Mortgage applicants must submit a series of supporting documents to the bank in order to secure a loan. The bank has identified around 200 different types of documents they receive by post on a regular basis, among them pay slips, employment contracts, passports and other identification cards, city council home appraisals, bank account statements, insurance policies, marriage certificates and pension documents.

Each parcel that arrives must be opened by one of the dozen employees in the central mail room. These workers must forward the documents on to the processing department where more than 200 clerks commence the time intensive task of identifying each type of document and correctly filing it with the corresponding customer record.

The volume of paperwork involved is large and the amount of labour intensive. On average 25,000 individual documents arrive every single business day and they all must be categorised and filed correctly. The problems with this process are threefold: the time to manually identify documents is too long, the chances for human error are high and the time required later for clerk to search and find a single document in order to approve or deny the customer's mortgage application is often lengthy.

To speed up this process the bank decided to implement a document capturing platform which automates the classification of documents and also performs key data extraction. FlexiCapture can be used in many different scenarios in almost any industry because of the ability to develop templates to read any type of document. FlexiCapture analyses each of the elements of a document – text, headings, graphics, etc. – to understand what type of document it is in order to correctly classify it.

In the bank's mail room document sets are checked for completeness, collected into batches and then captured digitally by a scanner. Each scanned batch is automatically imported into ABBYY FlexiCapture which classifies the document and then input's it into the customer's back-end, Document Management System (DMS). The 200 clerks are able to connect easily to the DMS, to quickly and easily access and retrieve the documents they need, in order to process the mortgage applications.

With the new solution supported by FlexiCapture distributed version, the bank is now classifying the vast majority of their incoming documents. Document separation is done early in the workflow at the scanner station to be able to reduce the possibility of errors. Documents which are recognized correctly are automatically classified into two types, which simplifies the search and retrieval process downstream. This automated document classification system reduces time and labor and creates significant opportunities for cost reduction.

The organization experienced a cost reduction of 50% on their incoming mail/mortgage documents, by reducing labour costs and efficiency increase. Over a three year period a company that processes on average 25,000 documents per day can see a total savings of 200 to 300%.



10.2.6 Go-To Market model

ABBYY Europe supports sales and marketing in these regions and works with ABBYY customers, distribution, and reseller partners. In addition to sales and marketing arms, the team also has a services and support division which provides technical support, project support, and additional services for ABBYY partners and customers.

The top reference accounts are:

- Chubb
- Connexions
- L'Oreal
- Toyota
- Kimco
- NetSpider

Reference account: **CompuPacific International (CPI)**

CPI is a Top 100 global outsource service provider specializing in business processes (BPO), computer aided design (CAD), human resources (HRO) and animation production from delivery centers in China and the Philippines. Founded in 1998, CPI is one of China's largest and most successful outsourcers. It serves corporate and government clients in Europe, North America, Asia and Australia.

The Situation - Serving a wide range of clients from different spheres (e.g., finance, insurance, Legal, public), CPI has to process a great number of paper documents of varied structure and layout. Accounting forms, census forms, invoices, medical claims and other documents pass in bulk every day. The efficient management of the incoming data is essential for business performance and can give a competitive advantage. The primary business goal of CPI is the processing of the maximum number of forms at the minimum value while keeping the highest recognition quality.

The challenge - For a long time the document workflow was a bottleneck in CPI's performance. Many overseas major BPO companies have already automated its document workflow embracing OCR and data capture technologies, while CPI was still using manual data processing. This traditional approach, especially applied to different form layouts, was tedious, time-consuming, and led to some typing errors. In order to optimize its business performance and remain competitive in the market, CPI decided to phase out the manual data entry and invest in automated document processing solution. ABBYY FlexiCapture a versatile document capture solution provided technology. FlexiCapture offers an extensive functionality and tools for document OCR, classification, processing of semi-structured and unstructured documents, key data extraction and validation, export into backend systems and archive systems.

The solution - In four months, the adopted technology of ABBYY FlexiCapture has been deployed on three servers. The new solution included such options as finding data in the documents, data export to a document management system with further indexing and sorting. Adoption of the automated data capture significantly improved CPI's business performance and increased overall process efficiency. With the advanced features of ABBYY FlexiCapture, the documents are classified, recognized and verified. In this way, the data can be transferred into accurate, searchable and highly structured electronic format in the business processes. Finally, CPI over all optimizes their recognition and business processes, error rate and save significant amount of money



10.2.7 Summary

ABBYY is a technology provider of document conversion, data capture, and linguistic software and services. The key areas of ABBYY's research and development include document recognition and linguistic technologies. ABBYY is founded by a Russian student in 1989. ABBYY's solutions are born from an idea to create dictionary software. While looking up words in a bulky dictionary he imagined an easy-to-use tool that would allow people to translate words in just a few seconds. Based on this concept ABBYY products are developed for document conversion, data capture and SDK software development tools. ABBYY expands their distribution channel with an International distribution network and partnerships with software (embedded modules) and Hardware MFP/scanning vendors. With over 900 employees worldwide, ABBYY products being sold in more than 130 countries around the world through an extensive network of regional and international partners to more than 30 million users.

As ABBYY recognized since many years as a well-known supplier of OCR and ICR technology supporting the capturing workflow of third party vendors, ABBYY launched since 2009 their FlexiCapture platform for Capturing all different kinds of documents like invoices, contracts, purchase orders or forms. FlexiCapture provides a single entry point to capture, classify and process automatically a stream of incoming mail (printed, e-mail, fax or text), into data which can be exported into business applications and databases. Based on the ABBYY OCR and ICR components FlexiCapture Data Extraction is accurate and reliable. ABBYY FlexiCapture, with its wide range of over 180 languages for printed documents and over 110 languages for hand written letters, is well prepared for international enterprises. Via a web based administration tool, FlexiCapture provides their users a 24/7 overview from any location. Via customization tools (scripts and SOAP API) and easy integrations with ECM, CMS and ERP systems are possible.

ABBYY FlexiCapture installations are available as a Standalone version for Workstation use a client/-server based Distributed version and a Server Version for integration into existing backend workflows. Therefore, FlexiCapture is perfectly suited for the SMB section, but also large enterprises in the higher end user or corporate segment can benefit from a FlexiCapture installation.

Based on the accurate OCR technology, the experience of ABBYY as a technology provider to MFP and software vendors for data capturing and processing, ABBYY's FlexiCapture solution is a considerable solution for small, medium and large enterprises

STRENGTHS

- Award-winning OCR/ICR/OMR/ and barcode recognition.
- Flexible platform supporting multiple implementation scenarios ranging from Standalone (desktop) via Distributed wo Server installation type.
- Supports >180 languages (OCR) and 110 languages (ICR)
- Seamless integration via API and scripting with any business systems.
- With its background and long history in OCR and ICR technologies strong technology/customer experience.



10.3 Kofax

10.3.1 Introduction

For more than 20 years, Kofax plc (LSE: KFX) has provided solutions that streamline the flow of information throughout an organization. It was and still is the company/product goal to manage the capture, transformation and exchange of business critical information arising in paper, fax and electronic formats in a more accurate, timely and cost effective manner. Kofax provides these solutions for customers in financial services, government, business process outsourcing, healthcare, supply chain and other markets.

10.3.2 Contact information

Contact information for Europe		Contact information EMEA	
Name	KOFAX PLC	Name	KOFAX BENELUX SA/NV
Address	15211, Laguna Canyon Road	Address	Zandvoortstraat 49
Zip code	CA 92618-3146	Zip code	B2800
City	Irvine	City	Mechelen
Country	USA	Country	Belgium
Telephone	+1 (949) 783-1295	Telephone	+32 (0) 9 239 8000
Fax	+1 949 727 3144	e-mail	info@kofax.com
e-mail	info@kofax.com	Website	http://www.kofax.com
Website	http://www.kofax.com		

Company Information

Headquarter	IRVINE , USA
Established (date)	1991
Offices and locations	32 offices, 700 authorized Global partners in 60 countries
Number of employees	1150 in more than 32 countries, 785 resellers in 64 countries
Revenue 2009-2010	Growth = 27,4% till € 215,8mln
Customers	10.000+



10.3.3 Background information

Kofax delivers these solutions through its own sales and service organizations, and a global network of more than 700 authorized partners in more than 60 countries throughout the Americas, EMEA and Asia Pacific.

Partners

Over the years, Kofax has developed a global network of business partners to bring customers the full complement of skills and expertise required to automate their document driven business processes. With hundreds of partners in more than 60 countries around the world, this partner ecosystem helps customers get the most out of their investment, where ever they are.

Kofax also collaborates with complementary software, hardware, consulting and reseller companies to deliver the most comprehensive document-driven process automation solutions. The Kofax Technology Alliance Program (TAP) aligns with the company's commitment to provide award-winning document management solutions to manage the capture, transformation and exchange of business-critical information.

Global Presence

KOFAX is a global organization and maintains a global network of more than 700 partners and resellers, 10,000 customers worldwide and its own sales and service organizations in the Americas, Asia Pacific and EMEA.

Today, KOFAX has its corporate headquarters in Irvine, USA, California and its EU headquarters in Mechelen, Belgium.



10.3.4 Product information

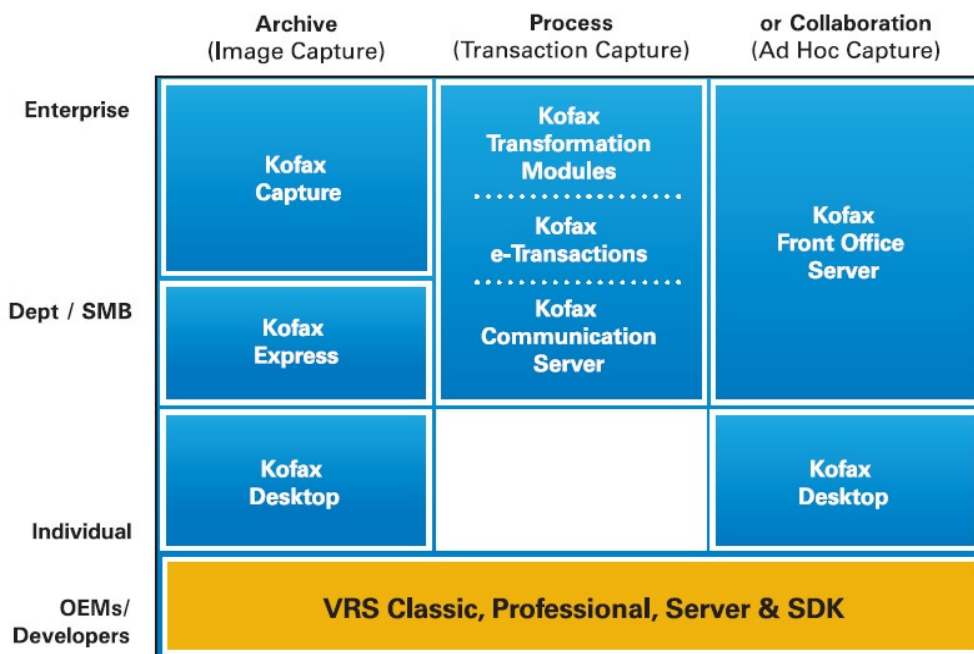
Document capture solutions from Kofax adapt to the specific needs of each organization to streamline and accelerate its document driven business process. Kofax present their portfolio as a modular and scalable suite of products Kofax products are classified in 3 areas.

- Archiving with image capture
- Processing with transaction capture /transformation modules
- Collaboration.

The combination of document capture and data capture is what Kofax calls "enterprise capture. "Kofax provides a single, unified platform for enterprise capture that enables business process automation by:

- **Transforming paper based documents** into digital images as soon as they enter the organization;
- **Capturing, classifying, extracting and validating** any document or form, regardless of format or type;
- **Automating the straight-through processing of information** into workflows and business systems; and
- **Auditing the processing of all documents** from point of receipt through to archiving.

The key advantage to taking an enterprise approach to document capture is the ability to immediately deliver extracted and transformed data directly into business systems. Moving from scan-to-archive to "scan-to-process" has profoundly changed the strategic importance of capture as an enterprise standard.





KOFAX VRS Elite

Kofax VRS Elite improves scanning productivity by reducing the time involved in manual document preparation and automatically enhancing the quality of scanned images.

Before Kofax VRS Elite, companies needed to hire document imaging experts to define scanner settings for their operations, and they still often produced unclear, skewed and downright unreadable images, leading to time consuming and costly rescans of the original documents. Today, Kofax VRS Elite automatically applies the proper scan settings and literally cleans scanned images, which improves the accuracy of optical character recognition (OCR) and handwriting recognition (ICR) software, reduces file sizes and minimizes document preparation tasks and manual activities that cost your organization time and money.

Reduce document preparation. Just yank out the staples and paper clips, stick your documents in the feeder and press the scan button. No experience necessary.

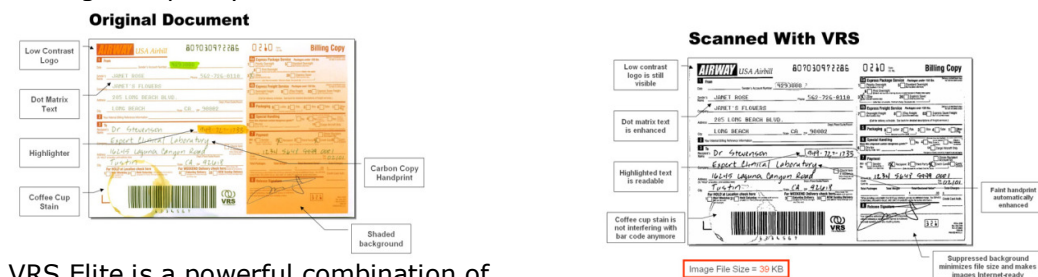
Capture color on demand without changing scanner settings. No sorting out black and white documents. No inserting separator pages. Kofax VRS Elite automatically determines how to handle your color documents at the rated speed of the scanner.

Make piles of paper disappear in the blink of an eye. Fewer manual tasks and less operator intervention means faster scanning and processing.

Produce the perfect image the first time, every time. Say goodbye to rescanning.

Kofax VRS Elite automatically corrects images for you and also provides simple tools to make quick repairs without ever touching the original document.

Enable effective distributed or remote scanning. Kofax VRS Elite reduces the complexity of scanning and helps to ensure that scans at your remote sites are of the highest quality.



VRS Elite is a powerful combination of hardware - a scanner card - and intelligent software which makes sure your scanner delivers always sharp, clean images; without manual intervention. A super cleaner for scanned images. The result is a very sharp image, necessary for the OCR, capturing and recognition process. With VRS all documents can be scanned mixed. This optimizes the separation process; especially with production scanning this is a great benefit. Because of the sharp and clean image, VRS provides a highly improved OCR, OMR and ICR image quality. The benefits of VRS stimulate both software and hardware vendors in OEM agreements and partnerships.

KOFAX express - desktop:

Kofax Express is an entry level desktop application which makes scanning, organizing and store documents easy and achievable, at speeds that make short work of batches big and small.

Kofax Express offers robust capture features such as real-time image viewing; watched folder; automatic indexing with bar codes; database lookup; JPEG, TIFF and PDF output formats; and flexible export to Microsoft SharePoint, Kofax



Capture and document repositories. It also includes industry leading Kofax VRS image enhancement technology that maximizes the efficiency of your scan operators. Kofax Express also offers easy installation and operation, enabling your organization to rapidly reduce costs and improve productivity.

Kofax Capture

Kofax Capture is a batch-oriented capture application designed to process large numbers of documents and forms with a high throughput and low cost. Kofax Capture is a modular and scalable application, out of the box and it can support the capturing needs of a small or medium sized business/single department and or it can expand to meet the needs of a high volume enterprise. Kofax Capture's design makes it easy to incorporate customizations that perform highly specialized tasks to fulfil specific enterprise requirements. The Kofax Capture platform offers accurate compatibility with scanners and other capture devices, content and document management systems, workflow applications, and databases. Independent to what hardware or enterprise applications are implemented, Kofax Capture ensures consistent capture, indexing, and validation of the information needed by an enterprise.

Kofax Capture is designed to support document/data capture and production/ad-hoc scanning in a single application. Kofax Capture extracts important information such as machine-printed text, bar codes, hand-printed words and even checked boxes. Most structured and unstructured documents can be scanned in a single batch, and the system will automatically recognize each document in the batch and process it based on characteristics that is predefined. Kofax Capture uses the same powerful indexing and validation process to capture information that doesn't start on paper, such as electronic documents. That means the workflow or content management system receives consistently indexed content – no matter what the source – and the enterprise benefits from reliable, easy and fast retrieval of all information.

Remote Capture:

Many organizations rely on document-driven processes that originate at a remote location but must be completed elsewhere. The Kofax Capture Network Server can be applied to manage the remote business processes. (see also Fig. 9.5.6 workflow and overview KOFAX remote capture) Included with Kofax Capture, the network server allows you to capture documents and data from your organization's remote offices directly into your Kofax Capture system. This can be applied as a local Internal company SAAS model.

Kofax Capture Integrates with Kofax Communication Server and Content Management Applications Kofax Capture uses standard release scripts to connect seamlessly to business systems from IBM, Oracle, Microsoft, Open Text, Hyland, Interwoven, and many others. Kofax Capture can also export to any ODBC-compatible database or to a delimited ASCII file. This flexibility makes Kofax Capture the perfect front end for any workflow and or database system.

Kofax Capture Enterprise Edition

Kofax Capture is also available in an enterprise edition that offers high availability and disaster recovery for company -critical applications. Remote, real-time management of system performance enables you to handle exceptions quickly and meet throughput requirements. Kofax Capture easily extends information capture throughout your enterprise by taking advantage of Terminal Services/Citrix server technology, providing remote, on-demand access to Kofax Capture modules, and enabling the processing of more documents in less time via



multiple-instance support. Additionally, Kofax Capture Enterprise Edition offers options for integration via a ECM platform to enterprise database management systems such as IBM DB2, Microsoft SQL Server Enterprise, and Oracle Database

KOFAX TRANSFORMATION MODULES (KTM) Kofax Transformation Modules is a processing solution which feature specific document classification, separation and extraction technologies that yield high accuracy even on the most complex documents like hand-printed and handwritten forms, invoices, Faxes, checks, correspondence and any other document type on a single platform. By applying KTM on every location in an organization for incoming documents, the input or the business processes, KTM delivers productivity, efficiency and improves quality. (see Fig. 9.5.8 KOFAX KTM Scheme)

Kofax Transformation Modules is powered by Kofax's learn-by-example classification, separation and extraction technologies, providing the highest accuracy and automation rates for all types of documents. Learn-by-example technologies are simpler to configure and easier to maintain than template- and rules-based technologies, reducing the total cost of ownership and allowing you to automate all your document-driven business processes.

Systems can be pre-trained to provide high levels of automation and accuracy on day one of operation, and automatically learn new document types in real time as documents are processed live. The technology even works for unstructured documents such as correspondence and for complex tabular data such as invoice tables.

Kofax Transformation Modules provides data validation capabilities that utilize your business rules, so data is correct before it is used by downstream processes and applications, reducing costly processing errors and exceptions that slow your business down and impact customer and supplier relations.

Kofax Transformation Modules features document recognition technologies that can classify, separate and extract any document, regardless of type, content or format, so customers can leverage a single solution for all documents and business processes across the enterprise, including:

- Invoice processing — Extract and validate header, amount and line item data from supplier invoices to cut manual data entry costs and reduce processing exceptions.
- Digital mailrooms — Classify all incoming mail as it enters the organization so it can be routed via workflow to departments and individuals, eliminating manual document sorting.
- Forms processing — Classify multiple form types and revisions and extract handprint and barcode data from them to eliminate document sorting and reduce manual data entry.
- Sales order processing — Extract order data from scanned and faxed POs and validate against catalogue databases, reducing the order-to-cash cycle.
- Scan-to-archive — Classify documents and extract multiple index fields to enable reliable posting to a document management system and easy retrieval.
- Document separation/identification — Identify individual document types within large packets or folders without separator sheets, reducing document preparation and folder review costs.
- Medical claims processing — Automatically extract data from US CMS-1500, UB-04 and all other claim forms to increase claims throughput and auto-adjudication rates.



Kofax Transformation Modules

Kofax Transformation Modules is powered by Kofax's learn-by-example classification, separation and extraction technologies, providing the highest accuracy and automation rates for all types of documents with the most rapid payback. Learn-by-example technologies are simpler to configure and easier to maintain than template- and rules-based technologies, reducing the total cost of ownership and allowing you to automate all your document-driven business processes.

Systems can be pre-trained to provide high levels of automation and accuracy on day one of operation, and automatically learn new document types in real time as documents are processed live. The technology even works for unstructured documents such as correspondence and for complex tabular data such as invoice tables.

KOFAX E-TRANSACTIONS

Kofax e-Transactions is an add-on application for Kofax Transformation Modules(KTM) that automates the electronic delivery of documents to a business process via secure email, removing the need for printing, mailing, scanning and data entry. Kofax e-Transactions allow enterprises to eliminate paper as quickly as possible, potentially at its source, and provide an effective and easy-to-manage mechanism for on-ramping business-related content into a business process as it is generated.

KOFAX FRONT OFFICE SERVER

Kofax Front Office Server is a collaboration module which manage on one hand the distributed capture and in the other hand supports multiple document input options like MFP's and scanners that are common in front office environments. This flexibility allows organizations to leverage their existing IT infrastructure and easily adapt to changes in document format or volume. Employees start processes with a few clicks at the digital copier or thin client scan application. This office automation solution reduces the days required to ship paper into just minutes via electronic transmission. Time spent shuffling, tracking, and filing that paper is replaced by customer facing activities like an optimized customer service degree which results in reducing operational costs. With the Kofax office automation solutions you can Speed up document-driven business processes by capturing documents in the front office, where they originate, and quickly deliver them to the systems that automate business processes. As this solution is quite intuitive, it is easy to deploy a front office based document capture and routing system with centralized management. As KOFAX delivers a modular and scalable workflow, it extends existing Kofax Capture workflows directly to the front office user.

Kofax Communication Server

The Kofax Communication Server is a workflow and communication solution that ensures the reliable exchange of business critical messages among applications, devices and people. It supports the automation of all business processes, regardless of location, device or media type, and helps to accelerate the business and reduce costs. The Kofax Communication Server provides native interfaces to integrate with the business applications like SAP, WebSphere MQ and AS/400; as well native integration into messaging Environments like Microsoft Exchange, Lotus Notes and Novell GroupWise.



10.3.5 Business applications

Application: “The MarkView Financial Suite”

The MarkView Financial Suite (formerly 170 MarkView from 170 Systems) automates financial processes to ensure consistent, efficient, cost-effective, and timely processing of all transactions. Leveraging imaging, best-practice workflows, electronic receipt and delivery of transactions, and unparalleled ERP system integration, MarkView enables Finance organizations to:

Reduce operating costs and cycle times. Our customers achieve dramatically lower costs-per-transaction with the MarkView Financial Suite, which captures and integrates all types of information and provides a single, consistent end-to-end process for handling all invoices --- paper or electronic. Best-practice workflows provide automatic routing of each transaction and its associated information to the appropriate individual for highly efficient review, coding and approval, accelerating transactional flow and avoiding mistakes. The increased speed and overall efficiency provided by best-practice automated workflows dramatically reduces cycle times.

Improve quality and service levels. Key controls are strengthened through automated and consistent best-practice workflows. Auditors and other process participants have fast, seamless access to transactions via MarkView's self-service interface. The extension of self service capabilities to all participants in transactions, including line-of-business staff and suppliers enables those involved in the process to answer many of their own questions and dramatically reduces inquiries to Finance, while providing improved service.

Supporting an end-to-end process visibility. Line-of-business managers have an easy-to-use interface that provides the information they need to make timely, informed decisions on pending financial transactions. Finance managers meet strategic business objectives through an actionable view of AP operations. Available from Kofax, Finance executives and managers have process visibility and real-time access that allows them to immediately address critical situations and meet commitments to internal customers and suppliers.

Optimize cash. Through access to real time process data, from comprehensive overviews to detailed financial reports, managers are empowered to optimize cash resources --- pay on time, avoid late payment penalties and capture all available discounts. Coupled with capabilities such as e-invoicing, this gives Finance managers and executives powerful cash management.

Application : Automation of Business Processes in the Mailroom

In many organizations, the daily work is initiated by distribution of the incoming mail to departments, groups and individuals. While scanning and image-enabled workflow can be utilized to transport these documents around the organization in a secure and auditable manner, significant human effort is still required to classify them in the mailroom. This causes processing delays, routing errors due to misinterpretation, and significant labor costs. Kofax enables organizations to automatically capture and distribute all mailroom incoming mail to the correct department, group or individual —whether it arrives by mail, fax or any electronic



format. These documents will be delivered to business systems and content repositories, replacing manual processes for managing high volumes of documents from a wide variety of sources.

Within the process of a digital mailroom KOFAX can manage the automation, classification, extraction and delivery to workflow of all incoming documents using self-learning technologies that provide the highest accuracy levels replacing error sensitive manual processes in the mailroom. Enhancing any scanned paper document irrespective of color, size, weight, contrast, condition or content, thereby increasing the efficiency and accuracy of downstream classification and recognition processes.

Benefits of a KOFAX implementation within a digital mailroom are: Documents appear in workflow in minutes, not hours. Telecom provider Swiss COM now make customer documents available to their staff less than four hours, compared to 2 days with manual distribution. Automation allows the organization to process more documents with no increase in headcount, so as your business grows, your costs don't. At Countrywide Property Lawyers in the UK, 90% of mail is now sent automatically to the correct department. Automating classification and extraction frees up human capital to focus on tasks that add value to your business such as customer service or query resolution. At Caremark healthcare, average staff productivity increased by 45%.

The automating classification and extraction reduces the need for costly human effort to process incoming documents. Office supplies giant Corporate Express saw their invoice processing costs reduced by \$1M per year.

An important issue within digital mailrooms is exceptions. Humans typically misclassify 1-in-20 documents. Kofax's classification technologies provide accuracy that cuts errors by up to a factor of 10, resulting in fewer downstream exceptions. Kofax provides an accurate and reliable process for classifying and indexing documents, allowing them to be stored securely in document and records management systems with the correct tags and retention policies.

Application: e-transactions

Kofax e-Transactions (KET) for Invoices is an add-on to Kofax Capture and Kofax Transformation Modules that enables you to process all incoming invoices, whether they arrive electronically or on paper, through the same powerful capture solution, ensuring that all data is extracted, validated and processed in a consistent way.

With Kofax e-Transactions for Invoices, the seller uses a Sender application to automatically capture data during the invoice printing process and send it via secure e-mail to purchasing companies Receiver application, which collects the data and prepares it for processing with Kofax Capture and Kofax Transformation Modules. The system delivers invoices to the ERP system with a single click – no mailing, no envelopes, KET provides an easy-to-use and cost-effective GREEN way to reduce the paper processing overhead between the organization and their strategic business partners. KET integrates/connects strategic suppliers directly into the AP process. KET avoids the need for costly EDI projects to map suppliers' ERP data to your own and avoids transaction costs associated with value-added networks. KET connects to existing ERP systems and investments without customization and enables both internal and external invoices processes.



10.3.6 Go-To Market model

KOFAX has 32 regional offices, with over 700 certified resellers in more than 60 countries. KOFAX received their business 50/50% from their partners and direct sales organization. The more complex, large and global projects will be handled direct. The KOFAX VRS technology is also provided as OEM to other capturing, scanning and MFP vendors.

The top reference accounts are:

- Sapient
- ABN AMRO
- ING DirectBank
- ADAC
- Vodafone
- Initial Hokatex

Reference account: Goldsmith Williams Solicitors

The Challenge - Traditionally, legal firms deal with thousands of paper documents. GWS is no exception on that score. On a daily basis, so many personal injury claims, court documents, conveyancing documents and loan agreements hit the desks of Goldsmith's officials. Maria Rodman, Head of Administration & Compliance at Goldsmith, knows first-hand of the problems caused by relying on information hidden in unorganized piles of paper. "Goldsmith Williams receives more than 8500 pages of mail per day. It's nearly impossible to manually process this deluge of highly sensitive paperwork in an accurate, cost-effective and timely manner," Rodman explained. "The tedious sorting, internal distribution, data entry and, once stored, retrieval of important client documents negatively impacted each employees productivity. Due to this unacceptable situation, we decided to look for a robust business process automation solution that was capable of managing our enterprise's different document types while maintaining the highest standard of quick turnaround time and that would improve our service level agreements to keep our competitive edge."

The Solution

Goldsmith Williams' criteria checklist for the potential new solution was detailed and comprehensive. After scanning, the solution should reliably classify all documents, automatically extract relevant data and then index it to the correct case reference. The solution should ensure proper mail categorization to enable prioritization and allow a seamless electronic flow of information both internally and externally. It should vastly avoid any manual engagement, should easily fit into the existing SQL backend infrastructure and should overall improve space, auditing, efficiency and business continuity. The Kofax solution, using powerful learn-by-example artificial intelligence to teach itself document classification and extraction, captures all incoming documents as soon as they enter the organization. The extracted data then gets categorized, prioritized and released to the firms case management system and in parallel to Goldsmith Williams' central repository and can be accessed from each desk within seconds. By linking into Goldsmith Williams "GWLive" portal, the solution also grants the firm's clients a 24/7 real-time access to the current status of their individual cases.

The Results - The implementation of the new BPA-solution at Goldsmith Williams demonstrates the manifold benefits of Kofax's information capture technology in high-volume capture environments.



10.3.7 Summary

Founded in Switzerland in 1991, but now headquartered in Irvine, California, Kofax plc. offers software and hardware solutions that help enterprises automate document-driven processes across a wide range of business functions including accounts payable, customer services, HR, mailroom and other areas that are document driven.

Kofax software offers scalability from centralized to highly distributed environments, from individual desktops to enterprise deployments and from basic scanning to powerful document classification and data extraction. The technology supports a wide variety of input devices and line of business applications, and leverages best-practice workflows and ERP system integration, providing a strong enterprise wide platform on which to standardize document driven processes.

- **Kofax Desktop**
- **Kofax Express**
- **Kofax Capture**
- **Kofax Transformation Modules**
- **Kofax e-Transactions**
- **Kofax Front Office Server**
- **Kofax Communication Server**
- **Kofax Monitor**
- **Kofax VRS**
- **MarkView Financial Suite**

With the modular and scalable solutions for scanning, image optimization, capturing, processing and routing to business systems. Kofax provides both small and enterprise organizations an effective solutions. Also through MFP vendors and local resellers KOFAX supports small and midsize businesses. As Kofax manage the whole workflow of scanning, capturing, recognizing and processing of incoming documents KOFAX solutions can be taken in consideration

STRENGTHS

- Modular and scalable out of the box solution portfolio to small, mid to enterprise
- Specialized in optimizing the scanning and document process.
- Delivering their unique solutions as a OEM.
- Covers the whole workflow of enterprise scanning, capturing and processing to ERP systems
- Supports a green and sustainable workflow of document management.
- True Global presence by 32 country offices, global strategy. partners and 700 certified partners.
- With its background in the MFP and printing business long history and customer experience.



10.4 Medius – MediusFlow

10.4.1 Introduction

Medius offers a generic workflow engine (platform) supporting organizations to automate the suppliers invoices with a PO(AP-PO process) and cost invoices without PO. Medius Flow supports any kind of incoming invoice process; however Supplier invoice management means that companies can optimize their incoming-suppliers invoice process. Some organizations, like governmental organizations only receive supplier's invoices. They never send invoices. Construction companies and companies specialized in products based on multiple parts (car manufacturers), receive a lot of invoices and send a few. If a scanned invoice captured and handled via MediusFlow, a cost reduction of 60% can be achieved. With a more advanced workflow, computers are connected to computers (like with EDI) a cost reduction of 75% is achievable. The administrations becoming much more efficient, the bill is faster Paid, the organization benefits much better from payment discount and electronic invoices can be stored digitally – which saves square meters.

10.4.2 Contact information

Contact information for Europe		Contact information Benelux	
Name	MEDIUS AB	Name	MEDIUS B.V.
Address	Platensgatan 8	Address	Voltaweg 23
Zipcode	SE-582 20	Zipcode	5466 AZ
City	LINKÖPING	City	Veghel
Country	Sweden	Country	The Netherlands
Telephone	+46 (0)13-10 63 54	Telephone	+31 (65) 1611470
Fax	+46 (0)13-327 29 09	e-mail	info@medius-group.com
e-mail	info@medius-group.com	Website	www.mediugroup.com
Website	www.mediugroup.com		

Company Information

Headquarter	LINKÖPING, Sweden
Established (date)	2001
Offices and locations	10 offices, 26 worldwide partners
Number of employees	150 in more than 10 countries
Revenue 2009	Growth = 66%



10.4.3 Background information

Medius was founded in 2001. Medius started with the business concept of supporting organizations optimizing their processes with a generic workflow platform. Medius offers products and services which simplify and improve the efficiency of processes within companies and organizations, with own IT solutions. Medius has transformed into a Product/Software company within recent years, in order to manage the global interest in their workflow platform MediusFlow. Medius' goal is to provide the best business process support solution with their workflow engine MediusFlow, and in order to achieve this goal they strategically offer a range of services and products in selected markets in order to stay up-to-date with movements in the market. In these strategic markets, such as the Nordics, Medius' goal is to provide business system support covering all aspects from the requirements setting phase to and including the administration phase.

Their products and support is in three business areas:

- Consulting,
- ERP and
- Workflow (MediusFlow) solutions.

In all other the markets outside the Nordics, Medius focuses on the offering of MediusFlow, the workflow platform with packaged process solutions and the workflow designer quickly deploy new workflow solutions. In this research, we evaluate the Medius' solution MediusFlow for workflow support for processes near or around ERPs or other administrative systems. MediusFlow is OCR and ERP independent, but Medius has alliances with OCR document capturing vendors, e-invoicing vendors and BPOs.

Medius is currently present in Sweden (HQ) and the other Nordic countries, the Netherlands, Germany, UK, France, USA, Australia, UAE and Poland. However, through their partner network of global, regional and local partners MediusFlow is globally represented.



10.4.4 Product description

In this chapter we will explain more in depth the Workflow solution MediusFlow, the way it automates the handling of incoming digital documents (invoices, purchases and agreements) to be processed to business/ERP systems

MediusFlow focuses on process improvement from the initiation of the process to the completion. This is important when reducing costs, the same time it is one of the drivers of workflow solutions. A workflow solution finds the users in the process and involves them when required and is integrated to other systems to trigger functions. This is more cost efficient than having users searching for tasks to be performed and follow documented procedures to complete the tasks by updating one or more systems manually.

The supplier invoice process is a well-defined process that many can automate to a very high degree. There are many other processes that can be implemented in a Workflow system and automated, such as purchase requisition process, order entry process from forms, HR processes such as investment requests. For companies that work in a tight supply chain with numerous companies linked together there are improvements that can be made by the use of workflow platforms in portals.

MediusFlow has primarily been used as a workflow engine to handle all the processes of "accounts payable electronic invoice presentment and payment" (AP-EIPP), but other applications like HR-salary docs, loan/mortgage docs, Insurance policies can be managed too.

The structure:

Medius has always been in the forefront regarding electronic invoice processing and because of the workflow engine; MediusFlow is currently the forefront of the overall business process design and enterprise content management (ECM). MediusFlow is developed and delivered in ways to meet the requirements and expectations of companies of all sizes. Therefore MediusFlow is offered as SAAS as well as a perpetual license, and it is modular to meet client specific requirements on configuration.

MediusFlow usually starts with the automation of the suppliers invoice in printed or digital format. The printed, PDF, Tiff invoice will be digitalized with a OCR/capturing solution and delivered to MediusFlow. The digital invoice XML, txt format will be imported direct in the system.

The packages:

- MediusFlow Supplier Invoice Management - a packaged solution on the platform that is flexible and can be applied in several formats. It includes automation of line level matching, automation of pre-accounting and automation of distribution. MediusFlow is delivered with a wide range of industry specific invoice-process related features, such as delivery plan matching for the car industry, matching of pre-invoiced goods which is common in the import industry where goods is paid prior to reception, project invoices and contractual invoices. This is the solution used to automate the AP process.
- MediusFlow Purchase management - a packaged solution on the platform that enables users to create and approve purchase requests prior to



purchasing, and to create purchase orders from these approved requests. Invoices can be matched to these pre-approved purchase orders, in the same way as PO-based invoices are matched to POs and GRNs in an ERP. This module is often used for improving the control and efficiency in the purchasing of items that previously was regarded as cost invoices.

- MediusFlow Agreement management - a packaged solution on the platform that provides companies with one common location for storing contracts and agreements. Reminders for expiration and termination are sent to users ahead of these events, and Invoices that refer to contracts can be matched to contracts.

With the above mentioned modules Medius offers several kinds of solutions, needed to specific customer requirements. Medius Flow contains: Supplier's invoice module, Purchase module, Agreements module, Workflow platform. The combination of the modules provides a complete Purchase-to-Pay solution.

The approach and how it works:

By installing MediusFlow, you can manage all kind of invoices electronically and thus streamline administration. The costs of invoice management can actually be reduced by as much as up to 75%. Today Medius systems often use scanned and captured data to import into Medius Flow (like the data from document capturing solutions). However, via collaboration with third party vendors Medius ensures customers the opportunity of using a complete "e-invoicing" solution. This will lead to lower costs for Medius customers when the need for scanning will decrease.

MediusFlow is not an ERP or business system in itself, but a compliment and most often as a slave to existing systems in use by their customers. It is a support application platform integrated into your existing business system, irrespective of which system you presently use. MediusFlow automatically retrieves master data from your business system and posts transactions into your business system through their integration gateway.

Set up the workflow

MediusFlow is a Client server based and a SAAS based solution. The client server based solution has a web entry and an outlook plug in. The SAAS solution has a web entry.

When a customer wants to automate their invoice workflow, the 3 following steps are key in this process.

- User interface to authorize and match invoices or related documents. Code all invoices with a PO number. MediusFlow tries like every vender making the GUI as easy to use as possible. In the solution you can define rights and roles in order to organize the responsibilities of authorization, coding and making PO numbers.
- Business intelligence to get full control of your data standard via Excel and optional a connector to your existing BI system. This Works similar to other MIS systems, however is integrated in MediusFlow and delivers standard a Excel sheet, which the controller can use for further calculations or presentations.
- Via the process intelligence you design your process and routing structure. You can also design the forms supporting the flow of the incoming data in the right format to the business/ERP system. The Process intelligence also gives you the ability to analyze your process to optimize it and if needed making the relevant adaptations. The admin



modules supports the management of the process and forms (adaptions and updates)



In practice:

Electronic Invoice

In this market research we talked about automated document capture management. Electronic invoice management has a lot of overlap. The workflow of handling incoming documents (invoices), capturing and recognizing the data, adding Metadata to be able to match with a business system and process the data to the business system. The benefits of electronic invoice management include reducing the need for resources, which in turn reduces management costs dramatically. It also offers a better overview of all processes in the organization, making it easy to locate individual issues.

Correct electronic invoice processing saves a lot of resources and fault costs. Traditional administration of supplier invoices often entails checking, account-coding and verification, and in some cases copying documentation and finally archiving.

Today the processing and distribution is usually manual and this is proven to be a significant and costly process for companies. Studies have shown that the cost of processing a supplier invoice can vary between 15 and 60 Euro depending on the company's work method and geographical location. The formats MediusFlow handles is XML, SQL, TXT and all common database formats. As soon as the digital documents are recognized like printed, scanned and captured invoices, the invoices are immediately delivered to the business system.

Printed Invoice

When MediusFlow manages purchase order-based invoices, it checks (with the added metadata) if there are any differences compared to the purchase order down to line level and terms on header level. If a deviation is identified, the invoice is sent for analysis in accordance with a distribution list linked to the type of deviation. If no deviation is found, the invoice can immediately be sent for payment in the business system. For invoices not based on a purchase order (expense invoices), the invoice is sent electronically to the appropriate reference person for coding and authorisation before it is sent for payment in the business system. You can apply your business rules for authorization levels and escalations and the system will ensure that your business complies with them. SOX compliance can be achieved with MediusFlow.



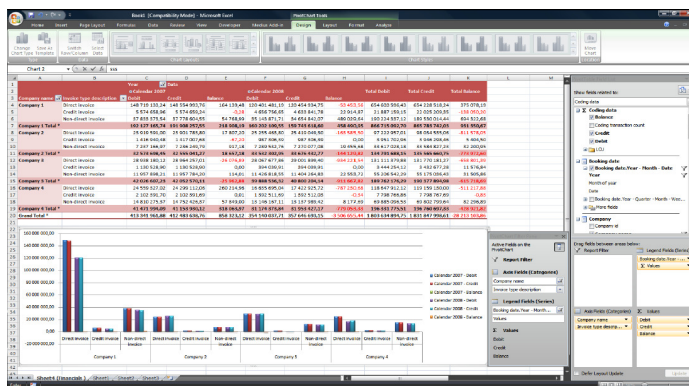
Regarding the approach of planning, Execution and Delivery Phase, Medius is quite similar to other DMS and workflow packages. However the focus of Medius is to achieve a Zero tolerance. Thus to achieve a fault tolerance of zero percent of the multiple incoming data streams. To be able to achieve a zero tolerance within the complexity of the several business processes, Medius flow have a rich set of features supporting the authorization, procreation and add a bandwidth to the matching process.

This matching process of invoices against PO's can be done statically and dynamically. MediusFlow can do both. Taken in account a standard invoice will cost the organization about € 35,- to € 50,- If there is a deviation of the invoice I.e. € 1,50-, the organization may decide to match this document as the deviation is within the agreed bandwidth of I.e. € 5,- Not just the prices can differ, also the amount, payment conditions, logistic costs.

How to deal with deviation is one of the most difficult tasks of the AP-PO process. To add a bandwidth the invoice may deviate solves 90% of the deviations. And the related costs. To add these functionalities to a automated AP-PO process, not only improves the automated handling of suppliers and cost invoices but also manages the deviations in this process.

Management information / Reports and summaries

To quickly understand the status of current and past invoices-processes, Medius Flow has an extensive reporting and surveys module. This gives the authorized employee a good understanding of all outstanding invoices, as well his financial position. MediusFlow delivers a rich set of features to search extensive, virtually every invoice or vendor. The management can create default reports, charts and statements that are both reactive and proactive created.





10.4.5 Business applications

Application: AP Processing - Cost Invoice

The application is to optimize and automate the Accounts Payable (AP) process with MediusFlow to reduce the cost of data entry and internal distribution, the same time reduce exposure to human errors and fraud. MediusFlow provides a web based interface (current development includes Silverlight technology) to handle invoices that requires their attention. It removes any geographical distances, it stores your invoices digitally, it's customizable and it is scalable to suit all sizes of organizations, from small businesses to large multinational corporations, as a result digital mailroom, a better control over the cash flow and total control over your invoices.

How it Works: The Handling of Cost invoices

Many of the steps that are involved with manual handling of cost invoices are time consuming and tedious task, and therefore ideal to be automated. MediusFlow automates the handling invoice process, step by step to be able to send the invoices automatically to the right recipients for approval and authorization. This routing process is fully customizable and you can specify distribution lists, authorization and coding rules according to your own preferences and applications. The same time MediusFlow enables you to ensure compliance by your organization to your corporate rules and regulations.

Digital Archive of Cost invoices

Invoices arrive in many formats and through many channels. With the workflow solution, MediusFlow enables you to process them in the same way independent of format or channel. e-invoices and EDI invoices enters MediusFlow automatically. Printed invoices first pass a capturing and indexing process like with Readsoft, and it may render humanly readable invoices for your users to view in the process. This is cost efficient and environmentally friendly. The routing of a cost invoice, from entering the organization as a printed or digital document, captured, indexed and processed through the organizations departments, ends mostly with a digital archive. MediusFlow stores all the data in a digital archive, including invoice images and logs of all activities, and all of this is searchable and retrievable instantly. Benefits are the overview, the grip on processes and security/ no more copying of invoices and eliminating the risk of losing valuable papers.

Application: AP Processing – PO-Based Invoice

A purchase order-based invoice is an invoice that can be checked against a purchase order. With purchase order-based invoices, the internal invoice management can be streamlined to the maximum with an electronic invoice management system. A purchase is added to a purchasing system, the business system or the MediusFlow purchase module. When the invoice then arrives, it can be matched, either at line or header level, against the purchase order and against the delivery. The invoice is then already authorised and coded on arrival, and if there is no difference between it and the purchase order, it can immediately be sent for payment. If a difference arises with a purchase order-based invoice, and the invoice is matched at line level, the appropriate person then only receives the deviation and can easily check the discrepancy, making a decision on how the difference is to be managed based on the information.



The difference between the automated handling of a Cost invoice versus a PO based invoice is the way you compare the invoice against the Purchase order. This is exactly what MediusFlow additionally provides to the cost invoice process- the automation of the matching PO – PO based invoice.

This allows the admin organization to focus only on exceptions and deviations, rather than on the bulk of invoices. The management of invoices with no deviations are fully automated while invoices with deviations will automatically be routed to the appropriate staff for action. The benefits are saving in the handling of Purchase Order (PO)-based invoices and streamline supplier Communications.

The Handling of PO-Based Invoices

The most time-consuming operation when handling invoices manually is to compare the invoices against the purchase orders and goods receipt notes (GRN); especially when deviations occurs. The invoice has to be checked and compared against the PO, line item by line item until the deviation is detected. This is often a time consuming and frustrating task. We call this the matching of the invoice. The invoice matching is done automatically, MediusFlow gives you the option to automatically match your invoices 2 and 3-way against a PO and GNR:s on line level, fully integrated with your ERP system.

The matching engine in MediusFlow automatically handles lines that are found on invoices but rarely specified on purchase orders, such as freight, admin fees, etc. according to the rules and thresholds that you define. This line level matching with an unparalleled matching engine is advanced and not often delivered by other workflow solutions. If a deviation occurs, the appropriate user is informed and pointed to the specific deviation and is given instant access to related information which may be used to make the decision on how to treat the deviation.

Application EDI based invoice handling.

EDI stands for Electronic Data Interchange and is a general framework that formed the basis for several different standards. EDI involves the transfer of information in accordance with an agreed format. EDI is often used to manage the transfer of information such as stock balances, catalogue information, purchase orders, order confirmations, delivery notifications and invoices between larger companies and institutions. A couple of EU countries currently uses STFI is a comprehensive suite of e-invoice management and e-business services. For e-invoice management, MediusFlow handles various formats of EDI, mainly focused on the Purchase order based invoices. Those invoices are the invoices for which the most time and money can be saved when they are managed electronically. When a purchase order-based invoice is received, the invoice is automatically connected to the purchase order and matched, if there is a complete match, the invoice is immediately sent for payment in the business system. However, if there is any deviation, this is sent to be examined in accordance with a distribution list in exactly the same way as for a paper based invoice. MediusFlow treats all invoices, irrespective of incoming channel, in the same way.

MediusFlow manages supplements for freight, packaging, tax and more, all of which are often specified on invoices but rarely on purchase orders. These types of charges are matched against rules, which includes accounting information and thresholds, in MediusFlow, and managed automatically. Any number of these types of supplements, or "Exceptions rules when matching" as they are called in MediusFlow, can be easily defined in the system. If these lines do not match pre-defined rules or are outside the threshold, they are managed in the same way as deviations for ordinary lines. Benefits of handling invoices electronically, Via EDI or similar system are: MediusFlow automatically matches the invoice on a row-



by-row level and handles 2-way and 3-way matching. As well Time saving, efficient process, fast overview suppliers status and relation

10.4.6 Go-To Market model

Medius has 10 own offices in 10 countries, and 26 Global partners. Medius chooses to work both via partners and direct. The first and second line support is done through the local office or partner. Third line or backend support will be done in Linköping, Sweden and Krakow, Poland.

Top reference accounts are:

- Abbott
- Cafebar
- Electrolux
- Saab
- IDG

Reference account: Parlevliet& Van der Plas(Netherlands)

Parlevliet& Van der Plas was founded in 1949 by Dirk Parlevliet and his brothers Jan and Dirk van der Plas in Katwijk in the Netherlands. Now 60 years later Parlevliet& Van der Plas is one of the largest European companies in pelagic fishing and processing. In addition to offices in the Netherlands Valkenburg (ZH), IJmuiden and Katwijk the company has subsidiaries in Germany, Lithuania and the UK.

Parlevliet& Van der Plas wants to streamline and automate their invoice management processes in their Dutch and German operations. The solution they want to apply is a workflow solution which communicates and integrates with their ERP system Final and Sage.

MEDIUS workflow business area deals with those processes that traditional business systems either struggle with or cannot cope with at all. This is supported by MediusFlow, which is essentially a workflow platform. Based on this workflow platform, a number of applications have been developed to support the payment request process (AP-EIPP), including modules for purchasing, agreements and electronic invoice management



10.4.7 Summary

MediusFlow is a capturing-processing workflow platform, which can be capitalized on for the development of workflows for any process. Medius Flow is mainly applied to the process of a suppliers invoice, matching process of the captured and Workflow data. The same time

MediusFlow can match a supplier's invoice with a purchase based order on several levels depending on the requirements of the company. Matching can occur partly at header level in a company that wishes to match at an overall level and partly at line level for companies wishing to check invoices in more detail. The system processes all the available forms of supplier invoice, such as EDI, scanned paper invoices and e-invoices. The application processes all invoices in the same way in a standard format. When discrepancies between validation periods or monetary limits occur, there is a flexibility to add a band width, and or the invoice is sent for checking in accordance with a circulation list connected to the agreement. If there is no circulation list, one is created manually. When there is no discrepancy the invoice is sent for payment directly. The advantage of electronic invoice processing is that the work load for the company decreases thereby radically reducing administration costs. Additionally, the company has better insight into all the flows in the **organization**, making it easier to locate individual tasks. Digital supplier invoice processing will allow the company to save the costs, time and resources.

As Medius Flow is a modular and scriptable workflow solution, with a focus on the suppliers invoice, adding modules like Purchase order and agreements. The solution can be applied on both Financial, logistic and HR processes. Currently MediusFlow has a large install base in the Manufacturing industries to automate the purchase based invoices. Both, in cooperation with capturing solutions for printed documents, and via electronic ways. The cooperation with nearly all the ERP vendors (over 60) can be seen as an advantage in the Invoice and logistic workflow.

When there is a need to optimize the process of the suppliers invoice by automating the capturing of your incoming invoices and logistic documents (printed and digitally), EDI/STFI and direct connection with any ERP system Medius Flow is a considerable solution

STRENGTHS

- Independent workflow solution to any Capturing and ERP system
- Specialized in automating the suppliers invoice process
- Have direct integrations with nearly all (over 60) ERP suppliers.
- Provides EDI – Inbound and outbound data processing
- Expert knowledge of workflow, the datastream for optimal datamatching –ERP system
- Available in mostly all the Scandinavian and Benelux markets with 10 offices and 3 global partners like Readsoft, Microsoft and Top Image systems.



10.5 NSI – Autostore

10.5.1 Introduction

Notable Solutions Inc. (NSi), a developer of distributed content capture and workflow solutions, Technology-training and Business Consulting; supports document management systems. With the cooperation of DTEC in 2009, NSi expands their distribution and market experience in the Benelux. It is the mission of NSi to optimize the customer's workflow, reduce costs and automate critical processes. This is the match between DTEC and NSi as DTEC wants to improve customer business, saving costs and the effectiveness of the human resources

10.5.2 Contact information

Contact information NSI Headquarter		Contact information Europe	
Name	Notable Solutions, Inc.	Name	DTEC B.V
Address	9715 Key West Ave. Suite 200	Address	De Mulderij 14
Zip code	MD 20850	Zip code	3831 NV
City	Rockville,	City	Leusden
Country	United States	Country	The Netherlands
Telephone	+1 240 683 8400	Telephone	+31(0)33-4519207
Fax	+1 240 683 8420	Fax	+31(0)33-4519208
e-mail	sales@nsius.com support@nsius.com	e-mail	info@dtecglobal.com
Website	http://www.nsiAutoStore.com	Website	http://www.dtecglobal.com

Company Information

DTEC Global	Leusden, Netherlands
Established (date)	2001
Offices and locations	3 offices, over 25 regional and international certified authorized partners.
Number of employees	± 20 (directly and indirectly involved in NSi Support)



10.5.3 Background information

Notable Solutions, Inc. (NSi) was founded in 1995 to provide complete technology solutions in the fields of Software Development, System Engineering, Technology Training and Business Consulting. Since 1995 NSi has evolved toward software and hardware design, development, network integration, and support of document management systems. As the foundation of NSi's family of products, is document capture, processing and distribution software, NSi was, with the introduction of AutoStore, introduced to new markets; e.g. the corporate and office market. Based on the knowledge and experience NSi was convinced about the added value of a connection between AutoStore, multi-function devices (MFDs) and desktop scanners with an organization's existing line of business applications such as enterprise resource planning (ERP) and content management systems. Since 2004, NSi started relationships with MFD vendors regarding OEM agreements and agreements with added value resellers of NSi AutoStore. Today nearly all MFD vendors and related system integrators cooperate with NSi.

DTEC B.V., Distributing Technologies is a reseller and system integrator of NSi AutoStore. DTEC supports MFD vendors, and cooperates since 2009 with NSi. DTEC B.V is founded in 2001 and is specialized in distributing and supporting software solutions for workflow AutoStore, security and access control, document capture-routing (NSi) print, media and document management. DTEC focused mainly on corporate and the Graphic arts industry. For NSi and security-access control, DTEC B.V supports the MFD vendors regarding pre and post sales, implementation and support. DTEC distributes technologies through jointly owned dedicated agencies and reseller channels



10.5.4 Product descriptions

NSi's AutoStore integrates the MFD's into a business process enabling distributed capture. Using the AutoStore framework, documents can be captured from devices, scanners, desktops and servers; processed centrally, and then routed into many different EDM solutions.

NSi AutoStore is a workflow and routing application, enabling the transformation of manual processes into electronic workflow. NSi AutoStore enables organizations to OCR, capture, classify documents, extract the relevant information and send it to an enterprise content management system or directly into the ERP/business system.

NSi AutoStore is a scalable and modular solution in following versions and modules:

- **AutoCapture** - AutoCapture is a capture component within NSi AutoStore that allows users to control, send and archive data/ content from their desktop systems or MFD into the DMS, ECM or business system. Via a drag-and-drop workflow design, using Actions and Forms, the solution can be integrated into web applications (MS Explorer, Ms Office 2003 & 2007, Lotus Notes).
- **AutoStore Express** - AutoStore Express is basic level document capture software that allows the user to capture, process, and route documents (paper and electronic forms) from a central location (I.e. MFD). The solution can be integrated with the MFD and network scanners. The solution route the documents to email servers, printers, FTP sites, network folders, databases, Lotus Notes, and Microsoft Sharepoint. AutoStore Express has an upgrade path already in place.
- **AutoStore Integration** - NSi AutoStore integration module is a server-based product that interfaces with the embedded NSi AutoStore client on following scanner trademarks. Fujitsu 6000N network scanner and Kodak Scan Station 500.
- **AutoStore Workflow** - NSi AutoStore Workflow is a business automation solution to transform and route paper-and manual-based processes into electronic workflows.

NSi AutoStore can be integrated into following desktop applications

- Microsoft Windows Explorer.
- Microsoft Office 2003 and 2007 (Outlook, Word, Excel and Powerpoint).
- Notes Lotus.
- Any application using the command line interface or the printer driver to AutoCapture

Scanning modules: NSi delivers following technology and enterprise Scanning modules, supporting TWAIN-enabled PC scanners and MFDs.

- NSi Quick Capture Pro a distributed capture solution
- NSi Quick Capture is a distributed capture solution like Pro, supports additionally touch screens or kiosks
- -NSi Smart ticket is an add-on which enables you to summarize your entire into a barcode on a single printed or electronic coversheet.

With above modules, the NSi AutoStore versions covers the data entry (via MFD's, Scanners, Fax and e-mail servers; in printed and in electronic format. Via



the processing engine (heart of NSi AutoStore) the data will be captured, recognized and processed to be able to route to the business systems

NSi AutoStore(server based workflow)

NSi AutoStore is a server-based routing application which manages the capture and delivery of paper and electronic documents into business applications. The focus of NSi AutoStore is to minimize errors and simplify handling of paper and electronic documents in your document management workflow. NSi AutoStore can use and connects to your existing infrastructure and captures information from your multifunction devices (MFDs), emails, fax servers, shared/public folders, FTP sites, Microsoft Office applications, PC desktops, XML data streams (in-out).

NSi AutoStore provides a generic platform with an open architecture. Regarding the input of data, it connects to any source, and if the data cannot import directly, NSi AutoStore can connect to a module to import these data automatically. Some of the modules are add on to NSi AutoStore, others are third parties. Important part of the processing engine is the OCR, recognition and classification. NSi AutoStore works with ABBYY OCR engine for an optimal recognition, which assures the right classification and indexing. The current OCR engine can be exchanged by other solutions. Depending on the process the data and images can be transferred to the right location in the business ERP, CMS or ECM system.

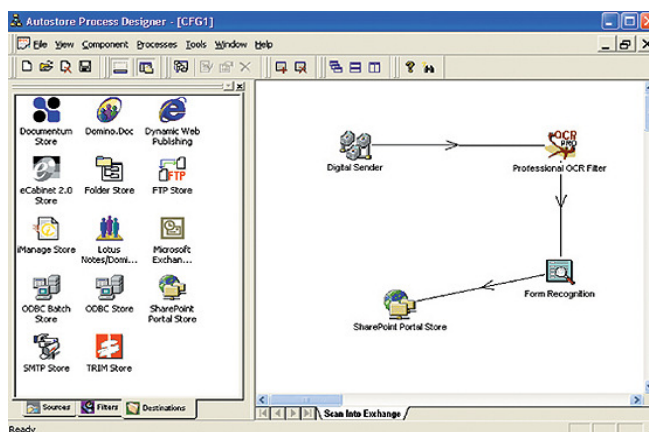
All processes in NSi AutoStore consist of the following layout:

1. **Capture** : Obtains documents, files and control devices
2. **Process** : Recognition, image management, conversion
3. **Route** : Stores the documents into the desired repository

The configuration is done completely in a graphical workflow designer, which eliminates the need for scripting, and creates new processes quickly. The Status Monitor allows the administrator to view the current state of the processes on the running AutoStore server. In the case of an error, notifications can be sent to the end user or an administrator using SMTP emails.

In the AutoStore workflow (design) module the workflow of the scanning, capturing, processing, classification and routing process is step by step defined. Per step you can select in the box- left the modules, which you can drag and drop on the worksheet, to design your workflow.

Step 1 The scanner or multifunctional printer needs to be applied for the scanning/data entry process. **Step 2** is the processing step. Here you can apply multiple functions for the best processing of the data in the workflow. **Step 3** is the Form recognition, which delivers the data from the form to MS SharePoint. Per step you





can define the parameters or scripts related to I.e. the MFD, OCR engine, relevant Form and which actions MS SharePoint have to take.

Via Java based solutions, the menu panels of the MFD can be customized to the vendor and applications. Scan to SharePoint, e.g. a driving license. In this way the MFD becomes a portal to enter the frequent received data into the business system. Via several add-ons, the workflow can be added with specific requirements to both Hardware (scanners) and business –ERP systems (specific integrations enabling computer to computer and EDI connectivity).

As soon as the workflow is designed, the user can select on the MFD (display) the application, Scan to SharePoint, and select the document type.

Like most of the Workflow and capturing solutions NSi AutoStore is hardware independent. One of the main reason most of the MFD vendors and OCR/capturing solutions Works with NSi AutoStore. In this area the AutoStore workflow solution is often applied and lets the user design his required workflow. The open architecture enables the organization to connect to all kind of data sources which benefits the flexibility in applications. In the workflow you can add security functions to the information to audit and control the data which leaves the company. In the same workflow design you can add functions like image improvement and ability to convert images to retrievable formats like TIFF and PDF/A.

Process description in AutoStore

By default NSi AutoStore processes all documents using a FIFO (First In First Out) schema. This means, that documents are received all the time (e.g. from MFDs), but processed one after the other just as they arrive. This schema is also true when it comes to the processing itself, as all processes are running in a clear linear mode.

Documents are captured using the AutoCapture component, and then a barcode is read, the documents are OCR'ed and finally stored into a folder. While from a process design perspective, this is very easy to be setup, there are some shortcomings when doing larger deployments:

- One large document can cause delays for all following processes (the process acts like a tube)
- After a server restart, documents might not be processed to a wrong process ID coming from not up-to-date devices
- A single process will not be able to take advantage of multiple CPUs or other load distribution methods
- Recovery of documents within a certain stage is not possible – a failed document will need to run through the entire process

Therefore, in enterprise deployments a process like the one above should be used in stages. Through this staging, you can separate each part of the process and as a result error-handling and load distribution becomes intuitive.

The communication between these stages happens through the NSi AutoStore knowledge packages (KP). A knowledge package is nothing more than an XML file containing the indexing information and the image or a reference to it. In next paragraph we will explain more in detail the communication of the NSi AutoStore system.

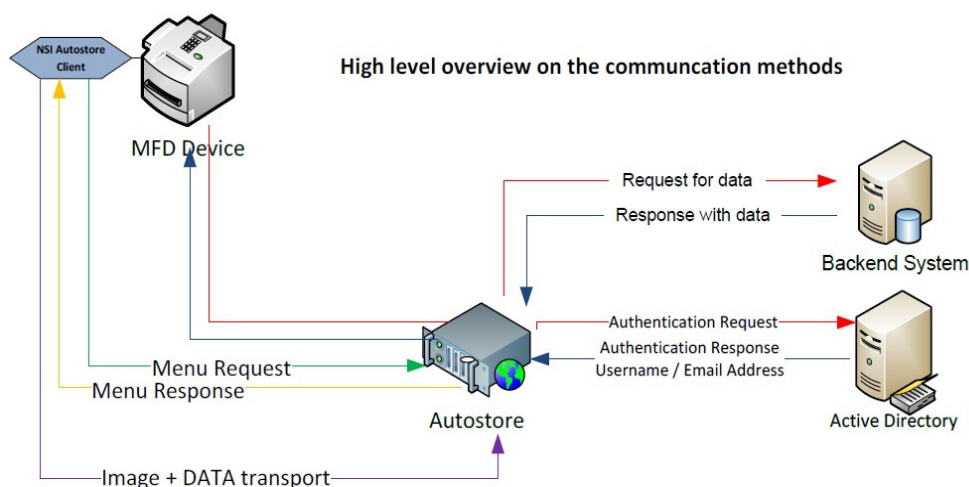
Communication of the NSi AutoStore server system



Since NSi AutoStore was designed to do decentralized capture, the server system uses the TCP/IP protocol to communicate with clients and to receive files. Therefore NSi AutoStore is very flexible when it comes to operating in all areas - a stable TCP/IP network will guarantee stable operation of the NSi AutoStore server.

Client to Server communication

NSi AutoStore always uses client/server methods when working with devices such as MFDs or other clients like AutoCapture. In these scenarios the NSi AutoStore server provides the configuration to the clients. The clients then display the menus for indexing and send back the image and indexing information to the server system for further processing. This web services-driven communication allows for central management. It's flexible because the real intelligence is "sitting" on the server.



Encryption can be activated in components that support it (this then completes communication between the server and the client that was encrypted). Or, the communication on that port can be also be placed into an external VPN tunnel provided by a 3rd party application.

Communication with 3rd party systems

You can link MFD's or other capture components through AutoStore into 3rd party systems such as databases used for ERP, CRM, etc. Those lookup features are provided by the AutoStore server while being triggered by the device itself.

Server to Server communication

In addition to the client to server communication it is also possible to have servers communicating with each other. FTP is usually used to route documents over the network, as FTP provides a stable and secure way to send documents. Also, the capture and route component for FTP in AutoStore allows for granular configuration of parameters to make sure the network does not get overloaded.

Cluster to server communication

This is used mainly in load balancing scenarios, where documents are processed on multiple servers. When using Server to Server communication in a local



network, the data will be held as Knowledge Packages on a central repository such as a NAS / SAN. All servers that use this information will access this central place via SMB.

Clustering and Load Balancing

As NSi AutoStore is a workflow solution with several capturing modules, security features and communication options and protocols, it also have the ability to manage the clustering and load balancing. When doing large scale deployments it is important to manage the capturing on all those devices via clustering and load balancing solution.

Clustering AutoStore- Clustering is usually used when it is necessary to provide a highly available gateway for all captured documents. AutoStore supports clustering using two methods:

- Windows Cluster Services
- IP Load Balancing/Clustering

Load balancing - To take advantage of the load balancing features, processes in AutoStore need to be staged as outlined in the "Inside AutoStore Section." Once a process is staged it can run multiple times on one single machine or on multiple machines.

Security plays an important role, especially when working in decentralized environments like branch offices – departments. NSi AutoStore provides five methods to ensure secure processing of documents and tracking of jobs within the system.

- **Device based security using AutoStore** Depending on where the MFDs are being used, security might be an important consideration. AutoStore lets you enable authentication on most MFDs, and authenticate users against Active Directory, NTLM, Novell or other systems using scripts. Those authentication methods are mainly username / password based, and while being not as easily used in smart card systems. Once a user is authenticated, he can use the device, the NSi AutoStore server can use those credentials for further processing, such as storing who-scanned-which-document-when, or retrieving things like a user home directory from the LDAP directory. When using this method all queries are run by the NSi AutoStore server, which means that security cannot be compromised as easily as if every device needed authentication. The only information that can be used by a user / administrator is the username or email address that can be retrieved from the device. For security reasons, it is not possible to access the entered username.
- **-Device based security using smart card systems with AutoStore** A more effective way of securing devices is to use smart cards or finger print reading. In these situations NSi AutoStore can be integrated using the following methods.
- **Device security manager:** This is the easiest way if supported by the device platform. In this case the device handles the security between the reader and smartcard system and provides the username to NSi AutoStore.
- **Server side integration:** In this scenario, NSi AutoStore will exchange tokens in the background and link them to incoming scan jobs. This server side integration needs to be built together with the vendor of the authentication system and might have certain pitfalls, since it is very time critical.
- **Device communication security** By default, NSi AutoStore uses unencrypted communication with connected clients. This is because encrypted communication causes more network traffic and is not always needed since



companies usually secure their network by using physical methods. If it is necessary, encryption can be enabled on most devices using the corresponding check-box in the preferences tab of the component



10.5.5 Business applications

Application: Distributed capture workflow managed from the MFD

To manage complex processes via 1 button on the panel of MFD is frequently required by several types of customers. Imagine the employment agencies, construction/building firms, schools, real estate, lawyers, and governments. Many organizations face the challenge of managing handwritten, printed and digital (PDF/XML/FAX) data, to get that data into the business system without all the current manual steps. The point is that many organizations have already installed a number of MFD's, and scanners. As AutoStore has an open architecture, and independent, if the technology is up to date, it would not be a problem to connect the install base hardware to NSi AutoStore.

Via a Java based application the menu panels of the MFD can be customized. The specific applications can be defined and programmed. Via specific buttons on the panels of the MFD the user can control the applications. In the workflow designer the requirements can be designed step by step with a drag and drop menu. Per step you can define which associate metadata fields and provide the ability to use post scanning features like image clean up and barcode recognition.



When the workflow is designed, the connections, scripts are made; the workflow can be tested with the relevant input. (I.e. a driving license) The scanned documents from the MFD will be received as an image in the AutoStore solution to be able to OCR, Captured, recognized, classified and offered to the DMS, ERP and CMS. In this way the organization is able to connect their MFD devices directly with document management systems such as Documentum Application Xtender, Microsoft SharePoint Portal Server, iManage and others.

Although AutoStore Express provides basic features such as OCR, and connectivity to applications such as Hummingbird, the integration with AutoStore workflow provides MFD devices with enhanced capabilities including major centralized server based management tools. For indexing documents where there is an existing document management system, end-users can use the NSi SMART ticket, which is a barcode generator. This web based application allows users to create a barcode cover sheet with index and routing instructions. The end user logs into the relevant site (via their standard web browser) and fills out a pre-defined index sheet. Once the proper options are chosen and the index data are entered, the end-user simply prints the sheet out and attaches it to the document they wish to scan. Once scanned AutoStore workflow will pick the document up and process it automatically based on the embedded data contained within the barcode.



For example, on behalf of an HR department, the IT administrator can setup an easy to use capture workflow using AutoStore's server based process designer. The IT administrator can set up the archive workflow to appear as easy to use menus and keys on the panel of the device. From the end user's perspective, an HR representative can walk up to a device and be prompted to enter the applicant's name on the résumé being scanned. Once the résumé is scanned, AutoStore will capture the document and the name entered at the device, pass it through pre-defined processes, such as OCR, and place the document into a corporate document management system. With one click of a button the resume is captured, processed and routed to the final destination based on the business needs of that particular department.

Application: Management information and monitoring tools

Most of the organizations, especially large enterprises want to have a cockpit to monitor their financial position. Therefore, it is understandable they prefer a monitoring tool/MIS system or Business Intelligence system connected to their document entry and or AP-PO process.

NSi AutoStore delivers a Status Monitor. This component connects to one or many servers and displays connected in the network. Therefore this tool is mainly used for real time monitoring of what is going on the system = NSi AutoStore workflow.

NSi AutoStore is creating log files when processing documents. These log files are created per process and use a time stamp to show all events on that server. Based on those logs, it is possible to find out what happened at the server at any given time.

The log files can also easily be analyzed and displayed and reported by Business intelligence tools like IBM Tivoli, HP OpenView, etc.

NSi AutoStore also delivers a workflow tracker / DTTR. The Workflow Tracker component can be placed into any process allowing to route information from this process (user, time, date, index information etc.) into databases.

The recommended tool for running reports is the NSi DTTR system, which is a reporting tool that allows controllers to run reports on the information captured by Workflow Tracker. DTTR also adds additional security, as it can monitor who scanned which document at which time, and which information was processed. An benefit of these solutions are the easy integration with existing tools like excel which can import the databases for further analysis and reporting.



10.5.6 Go-To Market model

DTEC is a Value Added Reseller of NSi AutoStore in the Benelux. DTEC supports the MFD vendors and end customers with consultancy, presales and post sales and installation and delivery tasks. DTEC provides first, and second line support, as well backend support in cooperation with NSi Europe. NSi and DTEC focus on NSi express and NSi workflow.

The small and midsize customers usually started with AutoStore express. Starting from less than € 1000, -. This can be upgraded to AutoStore workflow/enterprise edition. NSi AutoStore is a modular system, the organization can organize their workflow with add-ons enabling specific business process requirements.

The top reference accounts are;

- Bradford & Bingley
- Stibbe
- SOLID
- Druckerfachmann.de
- Alladdin

Reference account: Solid Entrepreneur Construction

The construction industry is not only about hanging drywall, laying concrete foundations, or building homes. Behind the actual labor components are volumes of paperwork: architectural drawings, permits, bids, invoices, change orders, emails and fax. Into this mix, add the time element – companies that have quick and accurate access to their documentation are first in bidding and cost control, which in this fast paced business makes all the difference in getting the contract.

Challenges

- Improve communication between vendors, contractors, landlords and employees.
- Reduce liability from errors in contracts, change orders and installation procedures.
- Avoid delays in project start and completion dates.
- Process invoices quickly and accurately to get the payments in time.

AutoStore uses the current MFD's available in the organization, to turn the paper documents and electronic files into digitized content that can be searched and located efficiently. On the MFD panels the different applications and buttons are the workflow is designed in NSi AutoStore Workflow Designer, with a connection to SharePoint, the documents can be routed directly to the DMS or ERP system.

Benefit for Solid Entrepreneur Construction

- Helps to turn manual business processes into electronic document workflows.
- Maintains accessible documentation for all project-related bids, proposals, and project status information.
- Automates invoice processing with forms recognition.
- Reduces costs from overnight mail and couriers.
- Minimizes physical storage needs for documents.



10.5.7 Summary

NSi AutoStore is technology providers of document conversion, data capture, and workflow solution and services. The key areas of NSi AutoStore focus are Document capture, Workflow automation and connectivity to business systems.

NSi background 1995 is network integration and support of DM systems. With the launch of NSi AutoStore in 2001 NSi made a logical step to connect networks, the data to the DMS and business systems. NSi AutoStore is a capturing and workflow solution with an open architecture, which means it, can connect to any capturing/scanning device and any DM or storage system. This is also the connection between DTEC and NSi 2009. Both want to optimize the data streams and automate the manual processes for any type of customers to be able to realize for their customers a cost effective and green workflow. DTEC supports their End customers and MFD vendors-resellers with the implementation of NSi AutoStore express and workflow.

As NSi AutoStore is a scalable and modular solution, for capturing and workflow it fits both for small and midsize enterprises as well the large and global firms. From a basic level of capturing and storage to a advanced workflow of capturing, processing (with advanced OCR engines from ABBYY), image optimization, classification, adding metadata and routing to the right location in the business system. Different modules/solutions are available like ERP connectors, smart tickets to add a specific barcode to the document, which will be read by the system to route docs to the right location. The distribution capture solution enables a global firm to remotely capture the data and store this centrally. Via the embedded solutions on the interface of the MFD, NSi AutoStore makes complex or labor intensive processes convenient for the user.

NSi AutoStore capturing and workflow installations are available as an express solution (non server based) from less than € 1000, - and client based server edition. Therefore NSi AutoStore can be found in the small and midsize enterprises as well in the higher end/corporate segment.

With the advanced data capture and OCR technologies as well as the flexible and intuitive workflow solution for routing the data to the business systems NSi AutoStore is a considerable solution supporting organizations in the area of recognizing, Data capturing, processing, Workflow automation and archiving

STRENGTHS

- Covers the whole workflow of data capture, processing, workflow and archiving.
- Available in a desktop and client server based solution.
- Intuitive workflow solution.
- Modular and scalable system via add on and extra modules creating your own solution.
- International company presence with EMEA partners like DTEC.
- Long history and experience in workflow and document management systems.



10.6 Nuance

10.6.1 Introduction



Nuance has a lot of different divisions focused on different type of markets, and for the purpose of this research we will focus on the Imaging Group. The Imaging Group includes the recently acquired X-Solutions and eCopy suites of products to deliver solutions for scanning, capturing, classification, processing and archiving. With its OCR and PDF based capturing solutions Nuance is now able to offer a wide range/portfolio of OCR, capturing and processing solutions for small offices, to large enterprises. As the main focus of the Imaging Group is the Hardware MFD vendors, Nuance positions its solutions as adding accuracy, performance, productivity and reduced costs-around the MFD (Multi-Functional Printers). With products for enterprises, small-to-medium-sized businesses and home offices, the company's imaging solutions are used to put the power of PDF on every business desktop; convert paper and PDF into documents that can be easily edited, archived and retrieved.

10.6.2 Contact information

Contact information for Europe		Contact information EMEA	
Name	Nuance Communications Inc.	Name	Nuance Communications Int.
Address	1 Wayside Road	Address	Guldensporenpark Building D32
Zip code	MA 01803	Zip code	B9820
City	Burlington	City	Merelbeke
Country	USA	Country	Belgium
Telephone	+1-781-565-5000	Telephone	+32 (0) 9 239 8000
e-mail	Info@nuance.com	e-mail	info@nuance.com
Website	http://www.nuance.com	Website	http://www.nuance.com

Company Information	
Headquarter	Burlington , USA
Established (date)	1994
Offices and locations	35 offices, 30 Global partners
Number of employees	6000 in more than 40 countries
Revenue 2009-2010	Growth = 40% till 1,2 Billion \$ 10% is in the Imaging division



10.6.3 Background information

Based in Burlington, Massachusetts, Nuance is provider of speech, text and imaging solutions for businesses and consumers around the world. Current business products focus on server and embedded speech recognition, telephone call steering systems, automated telephone directory services, medical transcription software & systems, optical character recognition (OCR) software, and desktop imaging software. The most notable development in the company's recent history was the "merger" of ScanSoft (hardware and software scanner company and a software company that developed the first OmniPage character recognition system), and Nuance in October 2005.

Partners

Nuance has grown through a commitment to open solutions and building a partner network that spans all areas of the business and across multiple geographies. Today, through its various channels and partner programs, the company maintains strategic relationships with more than 2000 partners - including Accenture, Avaya, Bosch-Blaupunkt, Cerner, Cisco, Dell, Delphi, GE, Genesys, Hewlett-Packard, Intel, McKesson, Microsoft, Nortel, Sony, Visteon and MFD vendors like Ricoh, Canon and Xerox – that help bring Nuance technologies, applications and solutions to global markets.

Global Presence

Nuance is a truly global organization, with capabilities and a worldwide commitment that can address a spectrum of customers. With its global resources, it is able to provide local market support for implementation, training and after sales support. The company has more than 35 regional offices, with a significant international presence in Australia, Belgium, Brazil, Canada, Germany, Hungary, Israel, Japan and the United Kingdom. With more than half of the organization residing outside of the United States and a sales presence in more than 70 countries, the company can deliver solutions to numerous local markets and bring global perspective and capabilities to its solutions. Nuance has its corporate headquarters in Burlington, USA, Massachusetts and its international Headquarters in Merelbeke, Belgium



10.6.4 Product description

Nuance delivers document imaging solutions for individuals, workgroups and enterprises. Its goal is to maximize the capabilities of multi-functional printers (MFDs). Nuance document imaging solutions eliminate the complicated and tedious manual process with scanning software and processes and enhance office performance and streamline workflow. With the addition of the Nuance OEM software (previous X-Solutions) for MFD manufacturers and Nuance eCopy for the enterprise applications and high-speed MFDs or scanners, organizations can transform paper documents into information that can be integrated easily into business applications. (Open platform)

Nuance positions its products for scanning, capturing and processing as follows:

1. The X-Solutions suite of products includes ScanFlowStore for Xerox, DigiDocFlow for Ricoh, Smart Office Scan for HP and SimplifyScan for Sharp. It is positioned as OEM – embedded solution for scanning, capturing and processing to archiving systems. Bundled and available as an embedded solution with MFD systems. (SME)
2. eCopyShareScan is more suitable in an enterprise environment.

1. Nuance X-Solutions products/OEM's was initially developed by X-Solution. After the acquisition of the company by Nuance, its solutions were integrated into Nuance portfolio of OCR solutions. Nuance's main distribution channel for these solutions is the MFD vendors who integrate/bundle the solution with their hardware (MFDs). This offering is focused on the process of Scanning/, Capturing, Processing and archiving as a complete workflow, for the office market. This OEM version of Nuance therefore has connections for the major business systems and is compatible with the most common file formats (PDF/A, JPEG, Excel, Word, TIFF or Open Office files). If more complex capturing is required, X-Solutions products can integrate with high-volume production scanning solutions.. The solution is an easy-to-use, intuitive digitization solution that helps organizations to simply and efficiently create digital archives by scanning documents directly to a destination from a multifunction device (MFD).

How it works:

Nuance's OEM products are embedded into the MFDs. Therefore, digital archiving is just as easy as making a copy. With one press of a button, a multifunctional device creates a digital copy which is stored anywhere, should that be on a server, or PC or shared folder. It ensures that the document is stored in a designated folder as a text-searchable document; for example, as a text searchable PDF file.

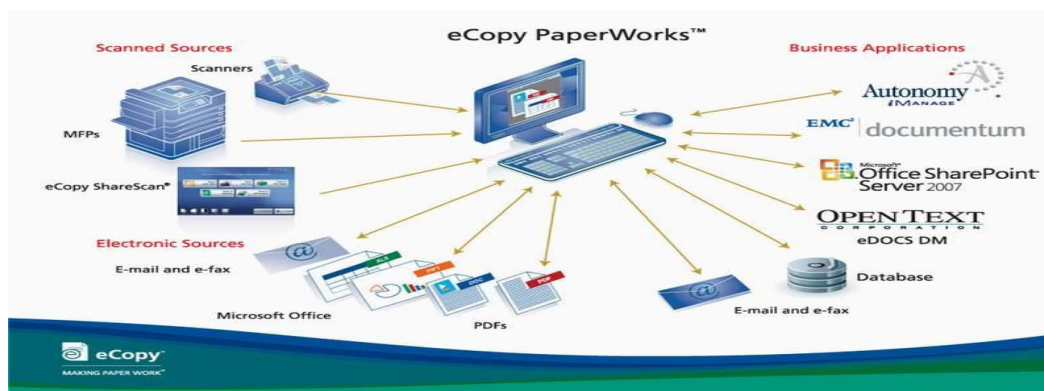
With NXO's Interactive client, it is possible to have real time bi-directional communication with your network. This means that it is now easier to specify the location where you want to store your scanned document.

Benefits of using the solution are:

- Integration into MFD system accessible via Display MFD
- Via scripting, automated document flow, from MFD to archiving or DMS system.

-
- The diagram illustrates the flow of content from a Multifunction device to a Desktop PC via Middleware and SharePoint. The components and their interactions are as follows:
- Multifunction:** A person is shown interacting with a device. A callout box indicates it "Determines type of content".
 - Middleware:** A central component that receives content from the Multifunction device. A callout box indicates it "Determines routing".
 - Desktop PC:** A computer icon. A callout box indicates "Scans can sometimes be modified before they're sent to SharePoint. This depends on the solution".
 - SharePoint:** A server icon that receives content from the Desktop PC. A callout box indicates it "Determines type of content and routing".
 - Scanner:** A device that feeds into the Desktop PC.
- The flow is as follows:
- The **Multifunction** device sends content to **Middleware**.
 - The **Desktop PC** (which also receives input from a **Scanner**) sends content to **SharePoint**.
 - Middleware** sends content to **SharePoint**.
 - SharePoint** sends content back to the **Desktop PC** (indicated by a dashed line).

With the addition of Nuance X-solutions products, Nuance positions its eCopyShareScan as a corporate environment solution, designed to integrate with the high-speed scanning capability of a Multifunction printer or a scanner. eCopyShareScan is document imaging and distribution software that transforms digital copiers and scanners into information hubs by integrating hardcopy documents directly into the workflow of critical business processes; these can include reporting, administration, document management, financials, human resources, and customer management



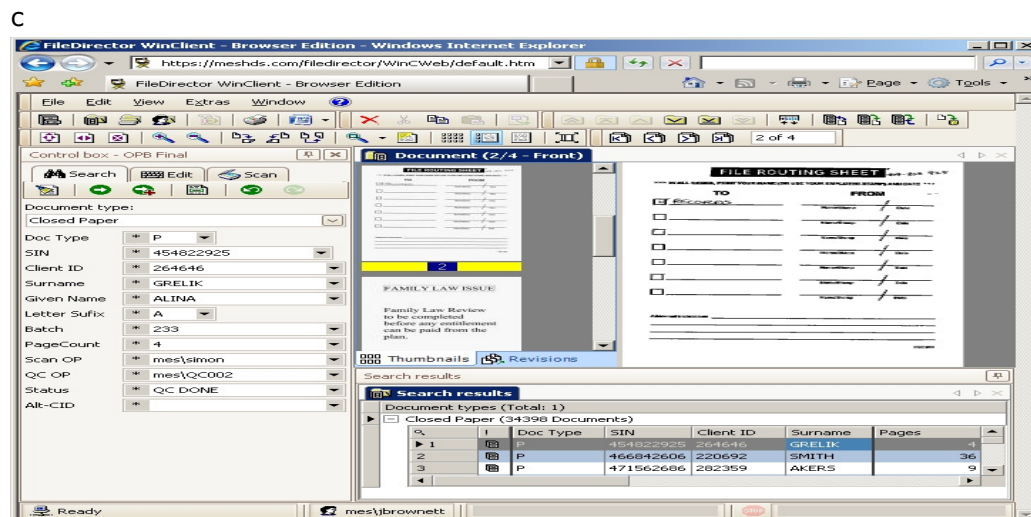
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How it Works Enterprise-wide Integration with eCopy

In the embedded option, eCopy is installed on one server to support multiple MFD systems. It converts your MFD device into a multipurpose, easy-to-use document distribution system. With the eCopy Suite of products, the organization can transform paper documents into information that is easily integrated into all your business applications.



As eCopy is an open platform solution, it can connect with your company's e-mail and other network enterprise applications for secure, economic, and instantaneous distribution and management of information. ShareScan is available on select MFDs as a software client, enabling eCopyShareScan to be accessed from the MFD's display panel touch screen and server hardware. ShareScan for scanners is a scanner with a certified ISIS driver.



ShareScan Essentials for scanners is available in two configurations:

1. With eCopyScanStation: The eCopyScanStation includes a free-standing touch screen and keyboard that connects to any ISIS scanner and MFD
2. Without eCopyScanStation, just on the screen of the scanner or MFD, with eCopy on the server.

Customers can control the scanning, capture and distribution from the display (shortcut and buttons on the MFD display). The documents are scanned on the



MFD, captured and recognized. With the added metadata, the documents can be transferred to ECM (enterprise content management) systems.

Additionally, with eCopyShareScan's administration tools, administrators can manage multiple devices from one central location. Here, eCopy delivers a platform for routing electronic documents from scanning to retrievable archive.

ShareScan is a document routing software platform that can capture and integrate scanned documents into business workflows through a standardized architecture, allowing software developers to create custom workflows that can be deployed at the device via simple buttons on a touch screen display. eCopy delivers connectors able to connect an organization's devices into content management systems. Examples include FileNet Enterprise Content Management system, Hyland Software's OnBase suite of ECM applications and Microsoft SharePoint Products and Technologies. Using these ECM connectors, the organization disparate MFDs and scanners, are integrated to incorporate paper-based content into electronic business processes. eCopy software products enable companies to scan and convert documents and images from a range of MFDs and scanners. The Connectors add the benefits of capturing information, transforming it into usable, business-ready content; security and audit trail information can be added, delivering the content to a variety of backend systems.

Benefits include:

- Effectively manage risks associated with paper documents, by native integration with Active Directory and eDirectory, audit trails and document tracking and Scan to PDF/A and encryption for document imaging.
- Enable employees to share paper documents and collaborate as they would with electronic documents by: Scanning to e-mail directly from a user's e-mail account from the MFD or scanner, E-mail address book/global address list access at MFD or scanner, Scan to fax, network folders, and FTP, Scan to Desktop, including the ability to scan to multiple users' inboxes.
- Enable employees to scan and send paper documents securely to themselves, enabling them to work with the information contained in those documents by: Scanning directly to editable Word and Excel file formats; using eCopy PDF Pro Office to annotate, highlight, and stamp documents with signatures and other graphic elements, and to combine PDF and other electronic documents into a single file; OCR to create searchable PDF files from scanned documents.
- Implement solutions that require little training and are easy to support by: graphical user interface, consistent user experience across all MFD's or scanners, central administration, User account-based security and access are dynamically updated from back end systems.

Expand systems to meet customized or evolving needs by: numbers of available integrations for popular applications, An easy-to-use software development kit (SDK) is available



10.6.5 Business applications

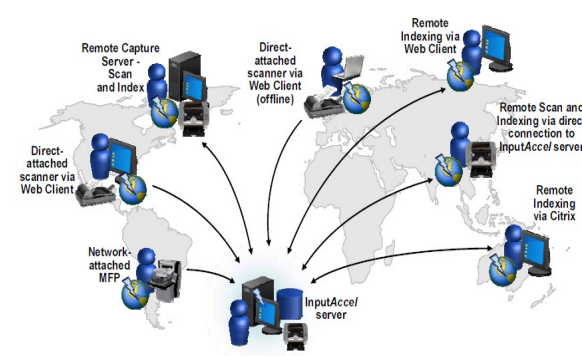
As Nuance is positioning two applications in the area of Scanning, capturing, classification and processing, here are two applications.

Application Distributed capture by eCopy.

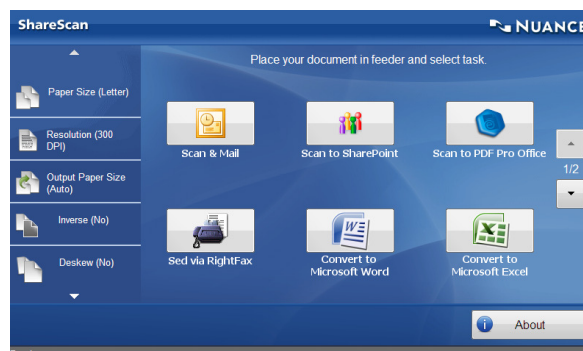
Traditionally, remote employees were almost always working in a business development or sales capacity. Today, virtually any employee can be found working in a home office or other remote setting – including those in back office positions such as accounting, finance, customer service, and other functions.

eCopyShareScan connects to network (MFD) devices, to scan paper-based information into ShareScan server, where documents are classified, data is extracted and validated, and the content is delivered to a enterprise content management system like EMC Documentum, to process the data effectively to the business system. Every insurance company has specific needs when it comes to adopting new technology. For example insurance companies that implement a distributed capture solution experience several key benefits that is significant to their industry.

The distributed capture solution available speeds up processing and turnaround time of property and casualty claims. Remote workers are able to quickly scan paper documents associated with a claim, add key indexing information, attach electronic files such as digital photos, and submit for processing – immediately reducing or eliminating the need for transactional shipping and associated costs. (see Fig. 9.4.9 Workflow remote workers) Additionally, insurance companies utilizing this type of solution are likely to have higher customer satisfaction since they are able to handle client inquiries in a timely fashion. Files in electronic format can be immediately accessed by back office staff, which allows claims to be resolved more rapidly.



Finally, paper-based content is merged with electronically-based content, allowing for a single cohesive content management policy and procedure. The eCopy solution integrates with the ECM solution, enabling any installed base of multi-functional peripherals and scanners to become scanning and document capture devices (see Fig. 9.4.10 Display and connections to ECM solutions). This reduces capital expenditures commonly associated with rolling out distributed capture solutions and gives in-the-field knowledge workers a scanning interface from the MFD. This combined solution results in workers utilizing their current





equipment better and removes the need to train them on yet another technology solution. Benefits are the efficient and effective use of the MFD. For incoming printed documents, eCopy can be used as a platform for processing the data to ECM systems. The user can control the system from the display of the MFD or from the eCopyScanstation.

Application- NUANCE X-Solutions Digital archiving

Nuance X- Solutions made several OEM versions of their solution for nearly all MFD vendors.. Nuance position the product as a scanning, capturing and processing solution for Small to mid- size companies, and therefore popular with the MFD vendors as a ideal solution (added value) to digitize the incoming documents/invoices and transfer these documents to the archiving system.

Digital archiving with X-Solutions is just as easy as making a copy. With one press of a button, the MFD creates a digital image which can be stored into any predefined location. The solution ensures that the document is stored in the proper folder as a text searchable document, for example as a text searchable PDF file. With its Interactive client it is possible to have real time bidirectional communication with your network.

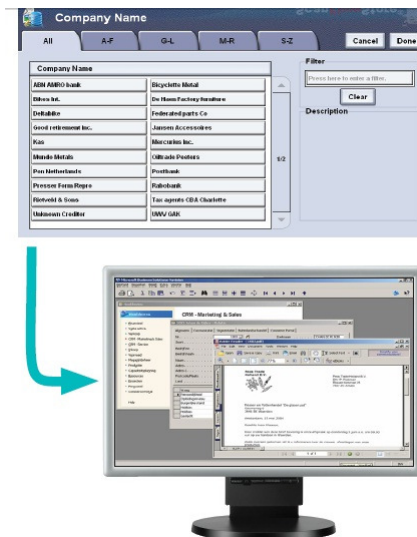
This means that the user can specify the location where you want to store your scanned document.

How it Works:

X-Solutions is a middleware application, which means that no software needs to be installed on a local PC. It is able to scan and store documents in the correct location within your Windows file structure. But when you use another application based on an Oracle or MS SQL database, or when you access your database through ODBC, all the information about the business relations, invoices, projects and opportunities is listed in this database. In this case it would be much easier to scan and store documents directly in your database, which can be done intuitively. With X-Solutions the document can be stored directly in the right location in the database of your business application; based on one or two questions answered on the multifunction printer.

It's possible to scan and store documents directly in different databases like Oracle and MS SQL. Additionally it's possible to scan and store documents directly into your company application when you use ODBC to access your database. Conditional metadata can be used. This means that the questions that users have to answer on the multifunctional device to store their document in the database of a business application are dependent of each other.

For example: When scanning to a contact folder in a business application, this contact is often listed behind an account. With this product, it's possible to select the account first on the MFD. When the account is selected the only contacts displayed for the second question are the contacts linked to that account. This way it's not necessary to browse through a list of all contacts in the business application and store the document quickly and easily.





10.6.6 Go-To Market model

Nuance has 35 own offices in 35 countries, and 20 Global partners over 80 countries. As Nuance offers different product families (for Speech recognition, Voice identification, Predictive text, Text to speech, Optical character recognition, document conversion and workflow) the company operates an indirect model. Regarding the Imaging Division (Optical character recognition, document conversion and workflow) Nuance works mainly via MFD vendors and value added resellers of IT systems. This guarantees local support, training and installation anywhere in the world.

The country offices supporting the MFD vendors and resellers provide second line support. Third line support is done in Merelbeke, Belgium.

The top reference accounts are:

- Credit Suisse
- Siemens
- Airbus
- Total
- Nokia
- PriceWaterHouseCoopers

Reference account: Reynolds Porter Chamberlain

Risk Management Firm applies eCopy™ to Streamline Business Processes. With more than 450 talented people, including more than 260 lawyers and some of the sharpest minds in the UK legal market, London-based Reynolds Porter Chamberlain (RPC) provides trusted counsel to a discerning international client base. The firm has 11 different practice areas, ranging from corporate and construction to real estate, tax and insurance, as well as a litigation team that combines expertise in large commercial disputes with a range of specialist skills.

Reynolds had following challenges: three separate authentications were required to access print/copy/scan and cost recovery functions; scanning was centralized in the reprographic center; paper filing space was constrained, especially after a move to new office space; with more remote workers, a paper-based work process was becoming less efficient; RPC was also interested in removing as much paper as possible from the litigation discovery process while maintaining appropriate security.

Reynolds wants their users to single sign-on integration, allowing users to swipe staff security card to be instantly and simultaneously authenticated on the relevant MFD's, eCopyShareScan document imaging software and the Copitrack cost recovery system. Another aspect to make distributed scanning/capture available for all employees. The result after implementations was a sign-on capability reduces authentication time from 60 to 90 seconds to five seconds for each use of an MFD. The same time up to 80% in time savings for users over previous (manual) processes. For expensive employees like lawyers and Insurance specialists this is a significant improvement



READSOFT

10.7 ReadSoft

10.7.1 Introduction

ReadSoft is a global provider of software solutions for Document Process Automation. ReadSoft's software enables companies to automate document processes such as accounts payable processing, document capture, document sorting, and order to cash.

READSOFT Capturing solutions are on the market since the foundation in 1991. Via a couple of acquisitions READSOFT extended their product suite with modules for reporting and management information. The history of ReadSoft dates back to a pet project by the two Swedish university students Jan Andersson and Lars Appelstål in 1980. They had seen how much time people spent on manually handling documents and thought that there must be a way to automate these processes. Since then these 2 founders developed READSOFT as an International company traded on the NASDAQ OMX Nordic Exchange Small Cap List. ReadSoft has operations in Australia, Benelux, Brazil, Chile, Denmark, Finland, France, Germany, Malaysia, Norway, Poland, Spain, Sweden, UK, and USA. In addition, partners sell ReadSoft products in more than 70 countries.

10.7.2 Contact information

Contact information ReadSoft International Head Office	Contact information ReadSoft Benelux
ReadSoft AB SödraKyrkogatan 4 SE-252 23 Helsingborg, Sweden Phone: +46 (0)42 490 21 00 Fax: +46 (0)42 490 21 20 Registered office: Helsingborg Reg. No. 556398-1066 VAT no: SE556398106601 www.ReadSoft.com info@ReadSoft.com	ReadSoft BV Astronaut 22 3824 MJ Amersfoort The Netherlands Tel: +31 (0)33 468 14 14 Fax: +31 (0)33 468 14 15 VAT no: NL8186.22.544.B01 www.ReadSoft.nl info.benelux@ReadSoft.com

Company Information	
Headquarter	Helsingborg, Sweden
Established (date)	1991
Offices and locations	16 offices in 16 countries (Australia, Benelux, Brazil, Chile, Denmark, Finland, France, Germany, Malaysia, Norway, Poland, Spain, Sweden, Switzerland, UK and USA)
Partners	300+ Global partners in more than 70 countries
Number of employees	450
Customers	3000+
Revenue 2009	€ 67,4 Million.
Share information	Traded on the Nordic Stock Exchange Small Cap list.



10.7.3 Background information

ReadSoft started as a pet project by the two Swedish university students Jan Andersson and Lars Appelstål in 1980. They had seen how much time people spent on manually handling documents and thought that there must be a way to automate these processes. Freeing offices from manual document handling has been ReadSoft's mission ever since. In 1988 Swedish college classmates, Jan Andersson and Lars Appelstål, begin investing their spare time in developing a system for interpreting handwritten characters. In 1991 ReadSoft is founded. The first customer, Yves Rocher, uses the software to scan incoming order forms. Since then the company developed and a number of technical innovations are launched, such as Fast Verify, Batch Handling and the ability to handle multiple languages. The late 90ths the handling of invoices (digital archives) becoming more and more important. ReadSoft started the first self-tutoring software for handling invoices.

The automated handling of invoices becoming a "priority", ReadSoft started with integration with ERP suppliers like SAP. ReadSoft Introducing a system for electronically sending and receiving invoices. In 2002 the SAP integration was extended by email and web functionality. This was the basis of an overall concept for capturing information from any document in any format. Since the acquisition of Danish Consist, which becomes the ReadSoft Lab – Oracle Solutions, ReadSoft has an integration and workflow for Oracle E-Business Suite. In 2006 ReadSoft acquires German Ebydos AG which becomes the ReadSoft Lab – SAP Solutions which resulted in an integration and workflow for SAP R/3. With these integration options with leading ERP vendors, ReadSoft heavily focus on the invoice and logistic processes.

Since the start in 1991, ReadSoft has grown to a worldwide group with operations in 16 countries on five continents and a network of local and global partners. The head office is located in Helsingborg, Sweden, and the ReadSoft share is traded on the NASDAQ OMX Nordic Exchange Small Cap list.



10.7.4 Product information

The ReadSoft Product portfolio is divided into 5 different groups.

1. Enterprise capture products for any business system
2. Purchase to pay for SAP®
3. Order to cash and purchase to pay for SAP®
4. Purchase to pay for Oracle E-Business Suite
5. Reporting and statistics

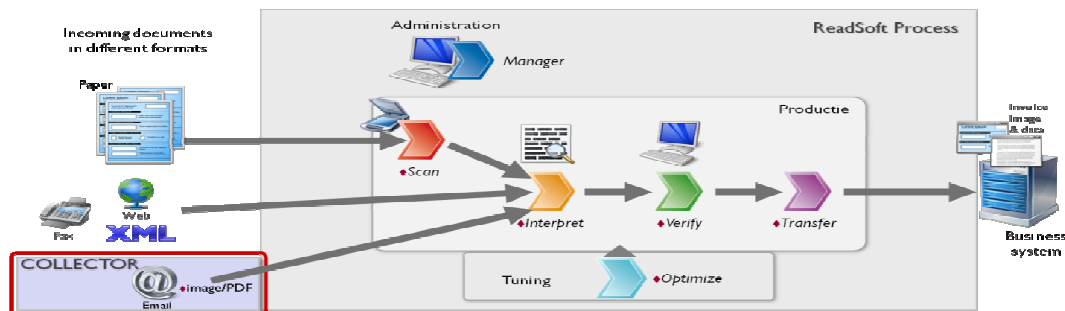
Due to the background and history of ReadSoft, there is a focus on scanning, capturing and processing of invoices; both on standalone-workflow and the Integration with ERP systems like SAP and ORACLE. The enterprise capture products represent the stand alone approach for incoming-mostly printed documents.

1→Enterprise capture products for any business system

ReadSoft's **DOCUMENTS** automates the tedious work of capturing, sorting and indexing documents. Gathering the incoming documents, both electronic and paper formats and let the document capture software do the, classification and indexing.

DOCUMENTS can be seen as a funnel for incoming business documents. No matter how they arrive (paper, fax, email, PDF, etc.), the documents are incorporated into the flow. The document capture software reads a document much like humans do. It looks for identifiers such as logotypes, keywords, combination of words and layouts. But unlike humans, it can also use barcodes, for example, to determine what kind of document it is and which group it belongs to.

DOCUMENTS analyze each incoming document and determine what type of document it is. Is it an insurance claim, an invoice, an order form, a loan application, a damage report, medical claim, a letter, a credit application, a change of address etc? The software classifies any document automatically and also bundles the documents into logical groups, for example, all documents belonging to a certain case.



After documents are classified, key information from the documents is extracted. This could be account numbers, insurance numbers, names or addresses. With the internal library DOCUMENTS finds and extracts that information automatically. This information, together with the classified document, is then ready to enter



into the (ERP) business system. (See Fig. 9.2.1 Workflow ReadSoft enterprise capture). This means that all the key information for any specific case is available in digital format. The extracted information is completely searchable, giving the ability to retrieve documents from your archiving/case management/business system. The solution gives you the option to get access to status reports and audit trails, which comply with legislation such as SOX.

COLLECTOR is an add-on to ReadSoft's data capture software. It automatically imports invoices attached to email straight into the capture software where information is extracted and interpreted.. How collector is integrated to the capturing solution.

Working in the background, COLLECTOR detects any image file attachment (PDF, TIF, PNG, etc.) and immediately transfers it to either DOCUMENTS or INVOICES. The destination is determined by the email address. The main benefit is that emailed data is automatically processed, just like paper documents. Identical business rules are applied and the data is transferred to your host system in the same way.

Depending on your settings, your incoming attachment may be ready for downstream processing in a matter of seconds.

INVOICES: Invoices are within the READSOFT workflow the first step to electronic invoice processing. The software can be seen as a funnel for all the incoming invoices, directing them into the same flow, regardless of source. "INVOICES" automatically extract information from any incoming invoice, validates it, and transfers it with a Document management/workflow package to an ERP system.

There are many ways for invoices to arrive: in envelopes, by fax, as email attachments, via XML or PDF. INVOICES handle all different types. Via the scanning process all information of interest can be capture, validation and verification of the invoices can also be handled automatically since the software comes equipped with country-specific profiles regarding tax rates, currencies, and date formats. Based on the added metadata, the captured information is exported from INVOICES to the target system for coding, authorization and approval by your accounts payable staff.

FORMS: Surveys, order forms, tax sheets, customer satisfaction forms, etc., can take a lot of time to process manually. ReadSoft FORMS software extracts information from forms and delivers the information to any workflow system. The software captures and processes all types of forms in any format.

The ability to handle forms in this way can save organizations a lot of labor time.

The **COLLECTOR** provides input from e-mail attachments. It is an add-on to ReadSoft's data capture software. It automatically imports invoices attached to email straight into the capture software where information is extracted and interpreted. It is suitable for a process when automated documents received via e-mail. Capture of image files like PDF, TIF, PNG, etc. from email attachments.



2 → Integrated SAP modules ReadSoft developed integrated solutions for SAP.

Work inside SAP

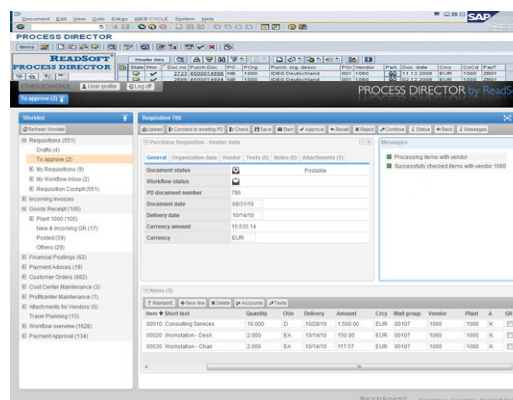
PROCESS DIRECTOR resides inside SAP. This means that you can work in your familiar SAP environment. It also means that entered information can be automatically matched against SAP data such as any kind of master data or transactional data (like existing purchase orders). If there are discrepancies between the information in PROCESS DIRECTOR and the data in SAP, the user is notified and can start investigating which information is correct.

Work in a web interface or inside SAP

Besides the web appearance PROCESS DIRECTOR also comes with an SAP user interface, showing the same data as the web application. Select the one you are most familiar with and switch whenever you feel like a change in your work environment.

With **PROCESS DIRECTOR**, you will improve control. Better control over your information flow and early notification of errors. Decrease costs & manual work. Easier to handle processes which can be quite cumbersome in SAP standard. Less staff is needed and focus can shift to more rewarding tasks such as process evaluations and follow-ups.

ReadSoft developed a front-end for SAP for all kind of invoices (printed or electronically) entering the SAP system. The SAP front-end has 6 different modules.



INVOICE COCKPIT automatically matches information on invoices against purchase orders and master data in SAP. For example, it can check tax number, bank details, company name and even line items. If the invoice matches the purchase order, it is automatically posted into SAP. The discrepancies are detected and presented to the user. After invoices are automatically verified, all the accounting tasks can be automated. If there are any errors on the invoice, or if there is no purchase order available (as with general expense invoices), the invoice is passed on to the electronic workflow WEB CYCLE. Automated transfer of invoice data into SAP.

WEB CYCLE takes over, after ReadSoft's INVOICE COCKPIT has verified your incoming invoices, in SAP. The invoices are routed to the correct people who can approve them or pass them on for further processing. SAP users can handle exceptions, coding and invoice approval inside their familiar SAP environment. WEB CYCLE uses your existing SAP system which means that users can work in an environment they know well. Users can also connect via a Web browser and approve invoices Wherever they are. This means no more bottlenecks when people are out of the office. Typical features are:

- Quickly obtain all information on release and account assignments.
- Easily clarify discrepancies between an invoice and the goods received.



- Check price deviations.
- Effectively integrate people into the process via a Web browser.
- Keep all data within SAP.

WEB BOARD is a web portal that suppliers log into to check the status of their invoices. The data is gathered from your SAP® system. You control which suppliers can access the portal and what they are allowed to see. It doesn't matter how your suppliers send in their invoices (paper, fax, email, EDI, or through WEB BOARD portal itself) – all invoices can be presented together with information on their current status. If a supplier wants to change the payment conditions, they can do so online. This way, the supplier gets the payment faster and you can benefit from a higher discount. You can even allow suppliers to enter the entire invoice in WEB BOARD, ensuring swift and smooth processing. Typical features are:

- View the status of inquiries including process and payment details.
- Electronic invoice submission.
- Purchase Order flip (a supplier can choose a purchase order that has been issued and turn it into an invoice, with a simple click of the mouse).
- Default invoice from purchase order data.
- Fast payment feature.

EDI COCKPIT, previously, processing EDI invoices with errors in SAP was very costly and time-consuming. This was largely due to the complicated cross-department communication often required in error handling. EDI COCKPIT provides a solution to this dilemma, making it possible to transfer incoming e-invoices with errors to INVOICE COCKPIT. Inside INVOICE COCKPIT, the AP clerk can complete or correct the invoice and start the workflow as usual. Error-free invoices can be posted automatically, and INVOICE COCKPIT maintains a complete invoice ledger. If, on the other hand, you have an invoice containing errors, the data is transferred automatically to INVOICE COCKPIT and processed according to your normal error-handling routines.

MOBILE APPROVAL is an add-on to ReadSoft's WEB CYCLE – an invoice workflow system for SAP®. Whenever there is an invoice to approve in WEB CYCLE, the recipient gets an email notification about this. This notification can be opened in a mobile phone or Blackberry. The email contains three different links, one to approve the invoice, one to reject the invoice and one to add further information. By clicking on one of the links, a message is sent to WEB CYCLE and the invoice is processed. Typical benefits shows up as long as you have an email client installed on your mobile phone or Blackberry, you don't need to do more than open an email and select what you want to do with the invoice (approve, reject or add further information).

INFO MAIL is an automatic response function allowing your suppliers to check the status of their invoices. With INFO MAIL in place, suppliers can request the status of invoices via email by simply providing an invoice number in the subject line of an email to a specified email address. The system automatically replies with invoice details such as date the invoice was received, its status, payment information (if applicable) and other pertinent information. Typical benefits are:

- Add-on to ReadSoft's INVOICE COCKPIT to improve supplier self-service. (INFO MAIL comes as a stand-alone product but also together with WEB BOARD)
- Handle incoming email status requests automatically.



- An easy and fully automated email service you can provide to your suppliers

3→ Integrated solutions for ORACLE E-business suite.

INVOICEIT is a control center and workflow for all invoices entering your Oracle E-Business Suite 11i. INVOICEIT enables automated invoice processing within Oracle E-Business Suite, release 11i. The software gives control of all the supplier invoices you have received:

- Where they are in the process
- Who has a specific invoice
- What you are waiting for
- How many days invoices have been pending

INVOICEIT automatically matches purchase order invoices with their purchase orders – even on line level. If the match is complete (INVOICEIT support 2, 3 and 4-way matches in Oracle), the supplier invoice is automatically posted, accounted for and made ready for payment. Non-purchase order invoices, or purchase order invoices with errors, are sent for approval in INVOICEIT's electronic workflow. INVOICEIT offers certified, end-to-end accounts payable processing within Oracle E-Business Suite and integrated Oracle Modules.

4→Reporting and statistics Immediate statistics on your invoice processing - REPORTER

Web-based REPORTER helps keeping track of documents and costs and provides all the accurate real-time information which is required to make business decisions. REPORTER, is an intuitive solution to set up new reports. With selecting the subject, the information is required, you can display a clear and communicative graph. The software uses a technique called Associative Data Mining which means that you can select any combination of parameters and get an updated report immediately. REPORTER provides vital information for process planning and improvement and provides an audit trail to comply with the Sarbanes-Oxley Act. Typical features are:

- Instantly creates any graph, diagram or table based on time, resources or your choice of production parameters.
- Displays any required level of detail. Digs down by simple clicks on the item of interest.
- Covers all parts of the invoice-handling process from input to the financial-system feed.
- Shows whether the system is operating up to its capacity.
- Helps you to pinpoint the origin of any problems that have occurred.
- Provides instant access to detailed information on production units.

The 4 different product/solution categories described in this paragraph, support various needs of automated document capture processes. The standalone process (nonintegrated system in SAP or ORACLE) and the integrated process. With the cockpit Reporter you can generate the management information, useful to support business systems.



10.7.5 Business applications

Readsoft focuses with their modular and scalable solutions on following areas:

Automating Purchase to Pay

Access to accurate purchase order details for automatic comparison as the delivery note and invoice are processed provides significant opportunities to remove effort, time, risk and cost from the process. Automating the entire process, from requisition to final invoice posting and archiving, can be managed by ReadSoft. The purchase-to-pay processes are basically the same regardless of industry type.

Order to Cash Automation

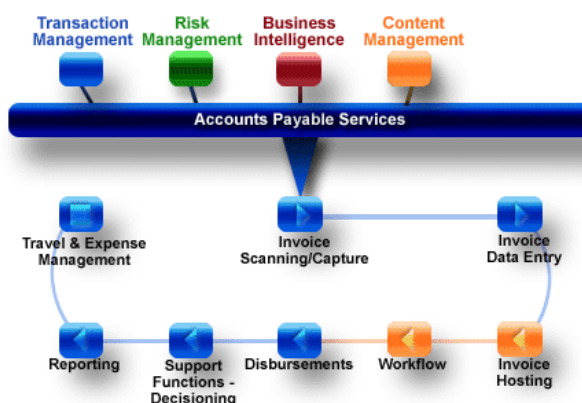
In these days of lean, automated processes, companies supplying goods or services seldom find bottlenecks in production or distribution. Managing all the paperwork remains to be a challenge. However, when a customer order is delayed because the incoming purchase order can't be processed quickly enough, it's time to take action. Effective management and order entry are keys to good customer relations, since they help determine the time needed to invoice and deliver goods. Together with automation you can minimize and eliminate problems such as:

- Lost and misplaced orders.
- Data entry errors.
- Wasted time from manual sorting and filing.
- Slow invoice processing, affecting the manufacturer's cash flow.

Enterprise Capture

Manual sorting, distribution and preparation bleed unacceptable amounts of time and resources from the qualified work that generates your income. That's why we'd like to introduce Enterprise Capture and automate away the drudgery while improving throughput, service levels and productivity in general. Within most of the organizations the documents (Invoices) arrive in several different formats through a number of different channels. ReadSoft Software solutions for document process automation helps companies automate their document processes. These processes could be for example:

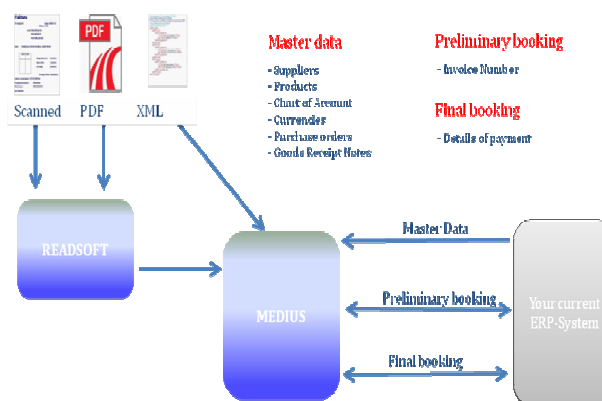
- Sorting documents
- Entering data into computers (from paper or electronic documents)
- Matching documents against information in an ERP system
- Approval workflows etc





Application: Enterprise capture

Enterprise Capture for sorting, indexing and distribution Readsoft background and experience is based on separate, sort, classify, index and distribute incoming business documents (mainly invoices and related logistic documents). This has been illustrated by the standard enterprise capture workflow for Readsoft. The applications are bundled into logical groups, such as all documents belonging to a certain case. This means that you can have an automated "mailroom" wherever it's convenient. The Enterprise capture solutions are applied to organizations with a substantial inflow of documents, such as insurance, energy, health care, public service organizations, governmental bodies and pension funds. Document inflow is basically the same, regardless of industry type.



Enterprise capture for Sorting, Indexing and Distribution can be applied in the following way:

- **Self-learning text classifiers** With providing a set of sample documents for each type and clicking a button enables the automatic recognition capabilities. You can put all incoming paper mail into the scanner (electronic documents enter directly) the classification recognizes the scanned data which are prepared for the extraction step. Whenever classification is uncertain, the operator is notified and can make corrections.
- **Extraction** After documents have been classified, key information – such as account numbers, insurance numbers, names and dates – is extracted from the documents. Fig. 9.2.4 shows the captured and classified data. The information is then transferred to the business system along with a document image. It is all searchable, providing access to the relevant documents.
- **Efficient management** User management allows specifying which operator is authorized to carry out which activities. Production supervision shows exactly where documents are in the system. This also provides a complete audit trail, supporting SOX compliance. (Auditing regulation according to international standards)
- **Integration** Select the output format(s) best suited to the downstream business system(s) or archive(s). Readsoft uses quite often the Workflow solution MEDIUS to route the captured and recognized data into the business system.

Application: SAP and ORACLE integration for all incoming mail.

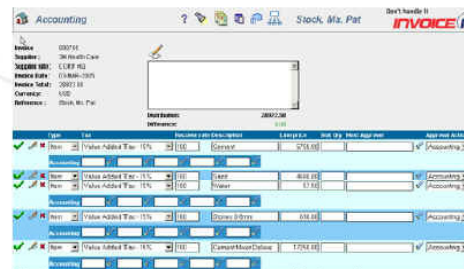
ReadSoft's SAP or ORACLE-certified solutions operate inside SAP or ORACLE as an integral part of the system. This means that users will work in their familiar environment and won't have to learn a new system. With ReadSoft's SAP-ORACLE certified solutions, it provides the automation:



- Procurement processes
- Delivery note processes
- Accounts payable processes
- Sales order processes

What the application does ReadSoft software automatically captures, interprets, and understands information from incoming documents such as invoices and purchase orders. Once data has been captured, it is automatically matched and verified against SAP/ORACLE. If there is a complete match between the document and the information in SAP/ORACLE, it can be approved automatically. You can also send documents off for manual approval in an electronic workflow. This can be accessed through the SAP/ORACLE system or a web browser. In that case the information and the corresponding document image are always available. You have a real-time overview of the workflow – where documents are in the process and who is responsible for next action.

SAP® Certified INTEGRATED WITH
Powered by SAP NetWeaver® **ORACLE®**
E-BUSINESS SUITE



Application: Reporting on Accounts Payable Process

"Companies are under increasing pressure to reduce costs, improve cash flow and drive efficiency. REPORTER provides all the detailed information required improving the accounts payable process, giving real time access to essential data and statistics to make informed decisions that will drive improvements and ensure compliance."

REPORTER works with ReadSoft INVOICES, enabling the automated data capture from invoices. Using REPORTER accounts payable teams can access detailed statistics on their invoice flow, such as how long it takes to process invoices from certain suppliers and where the bottlenecks are. Comprehensive reports will teams to pinpoint the strengths and weaknesses in the accounts payable process to drive improvements and aid process planning.

With The MIS system (Reporter's invoice workflow), covers all parts of the invoice-handling process from input to the financial-system feed. This gives the user control over the data and system. The same time it shows whether the system is operating up to its capacity. Is the system well organized and or does it need adaptations. As humans are part of the process and set up, Reporter helps you pinpoint the origin of any problems that have occurred. Thus to make quick adaptations, to improve the process and system. Business users can instantly access any required level of detail on any item of interest, such as a specific year, supplier or user, and create graphs, diagrams and reports.

REPORTER also provides an audit trail to comply with the US Sarbanes-Oxley Act, which can impact accounting teams in UK firms with a global presence.



10.7.6 Go-To Market model

READSOFT has 15 own offices in 15 countries, and 350 partners over 70 countries. Readsoft chooses to work mainly indirect via partners. The first and second line support is done through the local office or partner. Third line or backend support will be done in Helsingborg, Sweden.

The top reference accounts are:

- KLM
- Coca Cola
- Ernst & Young
- Calvin Klein
- Heineken

Reference account: COOP (Retailer)

One of the largest Retail organizations in the Netherlands is processing their invoices on one central place. To be competitive, realizing savings and improve the quality of their financial accountspayable processes, COOP decides to automate their invoice processing(680,000 invoices annual) with ReadSoft's invoice processing solution for SAP. Coop is able to process and book all supplier and general expense invoices into SAP with minimal manual intervention. Coop's office in Velp, in the Netherlands, receives paper and electronic invoices that previously were processed manually, which lead to lengthy and time-consuming processes.

The purpose of Coop's automated document handling project is to realize faster processing, booking, and payment of all incoming invoices in one integral system. Price differences between orders and invoices should be quickly and easily discovered. The results are faster and less expensive document processing and increased control.



10.7.7 Summary

ReadSoft's software is specialized in capturing data via scanned and digital sources across the different market segments.

Readsoft capturing solutions are heavily focused on incoming invoices and related logistic documents. Example of applications is data entry, capturing documents, classification, ERP matching, workflows and e-invoicing. The results are faster and less expensive document processing, and increased control. READSOFT presents there software suite in 3 different categories:

1. Enterprise capturing solutions for any (independent) business systems. Enterprise Capture for sorting, indexing and distribution - form processing - for invoice preparation. Enterprise Capture offers the tools to process any document combination, including handwriting. Enterprise capture digitize, classify, sort and distribute incoming documents, fully prepared to suit to the downstream processes. I.e. via third party workflow and document management systems
2. ERP (SAP and ORACLE) integrated solutions. With these integrations the software automatically captures, interprets, and understands information from incoming documents such as invoices and purchase orders. Once data has been captured, it is automatically matched and verified against SAP/ORACLE. If there is a complete match between the document and the information in SAP/ORACLE, it can be approved automatically.
3. Management Information System " Reporter" provides all the detailed information required to improve the accounts payable process.

STRENGTHS

- Focus on capturing and recognizing process
- Specialized in incoming invoices and logistic documents
- Direct integration with Leading ERP suppliers like ORACLE and SAP
- Provides EDI – Inbound and outbound
- Delivers a Management information with 1 click button
- Expert knowledge of recognizing the data stream for optimal data matching –ERP system
- Available in 70 countries with certified partners and own offices.

With the Sap and ORACLE integrated solutions, Readsoft made a step forward in the capturing process. Readsoft talks directly to the ERP system, without the "bridge" of a workflow/Document Management system. The same time the integrated SAP and ORACLE solution provide not just the handling of incoming Data (invoices/logistic documents), but also outgoing invoices and relevant documents. (EDI –inbound and outbound) This is the future for bulk exchange of invoices like with Governmental organizations, Retailers, Financial organizations etc. With the Reporting module Readsoft can make the relevant management information visible. When there is a need to capture your incoming invoices and logistic documents, a direct connection with SAP and ORACLE, READSOFT enterprise capturing modules, independently or via ERP/ORACLE are certainly considerable solutions



10.8 Ricoh



10.8.1 Introduction

Ricoh is known as a Hardware and software vendor as well as a reseller of third party products.

Since the launch and rapid growth of the MFD's, Ricoh has chosen to be not only a hardware vendor but also software and services partner for their customers. As Ricoh became a recognized player in the office market Ricoh introduces more and more solutions to optimize and digitalize document workflows in the office market. Since 2000 Ricoh is involved in Scanning, OCR, Data capturing and processing business around the MFD. This is pushed by the need of digital archive systems replacing the large stands with paper records. Ricoh has specialized their organization as a supplier for the global office, digital archive, and mailroom and document management systems.

Regarding scanning, capturing-classifying, processing and archiving of incoming documents Ricoh manage this with their On-line (Cloud) based SAAS solution One-Action-Flow

10.8.2 Contact information

Contact information for Europe		Contact information Netherlands	
Name	RICOH Europe	Name	: Ricoh Nederland B.V
Address	Prof. W.H. Keesomlaan 1	Address	: Utopialaan 25
Zip code	1180 AC	Zip code	: 5232 CD
City	Amstelveen	City	: 's-Hertogenbosch
Country	Netherlands	Country	: Netherlands
Telephone	+31-(0)20.54.74.111	Telephone	: +31 (0)73 645 24 38
Fax	+31-(0)20.54.74.222	Fax	: +31 (0)73 645 18 27
e-mail	info@ricoh-europe.com	e-mail	: info@Ricoh.NL
Website	WWW.RICOH.COM	Website	: www.Ricoh.nl

Company Information	
Headquarter	OSAKA, Japan
Established (date)	1936
Offices and locations	150 offices, 700 authorized Global partners in 150 countries
Number of employees	108500 in more than 150 countries, 785 resellers in 64 countries 1500 FTE in the Netherlands, 17 Ricoh centers, 100 dealers
Revenue 2009-2010	Growth = 1% till €18 Billion



10.8.3 Background information

RICOH Netherlands have 1500 employees within their direct organization. This organization supports their major accounts, 17 Ricoh Document Centers, 19 Self-service dealers and over 80 RICOH resellers. Both the direct and indirect organization (dealers and RICOH centers) are selling the One-Action-Flow solutions, as this is an important value on top of the MFD business. However the resellers provide first line support (technical to get started and commercial, consulting the customer regarding the business case). The RICOH centers and direct organization providing second line and third line support. With the Cloud platform RICOH can easily add new products and services on the MFD, supporting their dealers and customers remotely. In the past it was quite difficult for dealers to sell solutions, because not all the dealers had enough technical skills. Today with the cloud model this is not a problem anymore. The customers, partners and resellers are always guaranteed of the latest version and 24-7 system support

Ricoh is a supplier of Hardware products, software and services in the area of IT and document management solutions. Ricoh is founded in 1936 and started with their camera business. With the development of the Ricopy, the first office copier in 1955, Ricoh enters the market of office copiers and printers. In 1974, Ricoh launched the RIFAX 600S, a high-speed office fax machine. In 1985 Ricoh presented the first digital copiers, which enables document copying and scanning. Since the copiers were extended by network connections, network scanning, like scanning to a folder on your PC was born. In 1995 Ricoh launched their multifunctional printers in a format as we still recognize today.

Thanks to the role Ricoh played in the rapid development of the digital-global-office market, Ricoh became recognized in sustainable document solutions-green workflow.

With 108,500 employees and offices in over 70 countries, the Ricoh Group currently is well represented all over the world.

In order to meet the demand and requirements of large enterprise (International and Global) accounts, Ricoh is able to present the company, organization and experience-products as 1 global firm who can support these types of customers in a professional and global way.

Ricoh is presented in nearly all market segments and offers hardware (MFD and finishing) software, consultancy, project management, and ICT expertise, all you need to manage information and document management in a professional way. In this vendor profile we evaluate and present the way Ricoh manage with their portfolio of scanning, capturing, processing and archiving solutions for their customers.

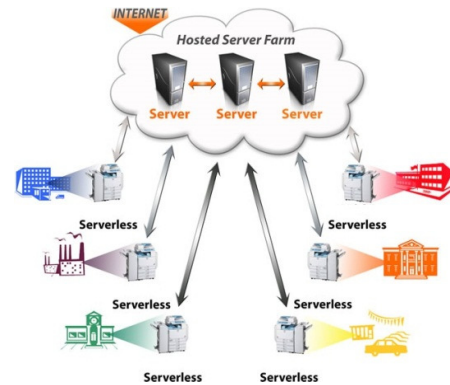


10.8.4 Product information

Cloud computing for Scanning, capturing and processing by One – Action-Flow

Ricoh made a strategic step in developing and launching their cloud platform One Action Flow. One Action Flow delivers SAAS- based integrated MFD solutions for Scanning, OCR (recognizing), Capturing and processing of documents which runs on-line in the CLOUD.

What is a Cloud Service? A cloud service is internet-based/on-line, meaning that One Action Flow is hosted on a server farm on the internet. Cloud computing is a form of outsourcing, by which vendors supply computing services to lots of customers over the Internet. A simple answer it means renting (instead of buying) software services. Most of the renting is done between one corporation and another, but such renting frequently occurs within a company as well. Inside a corporation it may be the IT group that is responsible running the software, and the business units that pay an internal fee to use the business critical solutions they provide. The customer selects his required functionality, which will be activated in the cloud and connected to his Customer/machine code.



Ricoh is delivering this On-line cloud bases solution under the brand name "Werkbox". For Ricoh and its customers it is a great benefit offering software and services on-line via the Cloud. Depending on the customer application, the right solution can be chosen, as well the installation, configuration, service and support can be done remotely. In this report we research the scanning/OCR, capturing, classification and processing solutions. To handle them via the Cloud is new and therefore interesting to investigate.

How it works:Eternia:

Eternia enables users to start document distribution right from the convenience of the Ricoh MFD panel-screen(s). The idea behind Eternia capture is to transform your MFD into a document portal and allows for functions such as database lookups, form population, scan to archive systems, and scan to fax and email.

All of these functions can now be utilized with Eternia as a hosted service. Eternia Cloud Service is easy to install, use and maintain. It requires minimal IT involvement. This opens up more opportunities for organizations without IT department but still interested to take advantage of the features Eternia offers.

The customer/user must have a Ricoh MFD device for printing and scanning. This device is connected via the network/internet to a cloud based Scanning, OCR, data capturing and processing application. Eternia, as the name already tells us, in 1 action- push on the button on the screen of the MFD, the user can start the scanning- capturing process of Eternia which actually runs in the Cloud. As a cloud platform might be a little vague, in fig. 9.6.3 we explain the process which gives you better





understanding of a cloud platform and how the Ricoh Eternia and its applications runs on this platform.

RICOH CLOUD platform for Eternia

Process description:

1. The customer bought a Multifunctional with specific requirements like scan to business system
2. Ricoh can deliver or develops an APP, which can be scanning to the specific business system (I.e. scan to Exact on-line). This App is based in the cloud on the Application server.
3. The app will be pushed to the MFD (Serial Number is known in the license server of Ricoh) and automatically a button is created on the Panel of the MFD I.e. "scan to Exact on-line".
4. Via this web based system, customer navigates to his own URL <http://CUSTOMER.ricohWerkBox.nl>, and develops several kinds of roles. (Administrator, users etc.) 6 Roles are standard.
5. The DMS receives a landing page on which specific information can be managed and handled like: Company news, specific department tasks, projects and files, personal information tasks, projects and files. On customer level the landing page can be full customized.
6. Standard there are 5 different flows:
 - Mail handling
 - Invoice handling
 - Customer files
 - HRM files
 - Project filesPer document flow there is a generic mailbox from where documents are filed can be added to the files and document flows.
7. There is an option, more users work on 1 file(like customer/employee, Project etc. and document. The user can add following Meta data to the mail piece:

Stand. Mailpiece

- Name
- Title
- Mail type
- Sender
- Remark
- User
- CC
- Data Deadline

Invoice

- Name
- Title
- Invoice data
- Credit Number
- Credit Name
- Invoice amount
- Coding
- VAT amount

HRM Doc

- Name
- Owner
- VAT number
- Starting date
- Date of born
- Position
- City

For each document type the distribution and controlling/agreement policy differs, which can be managed by the system.

8. As soon as the user stands in front of the MFD, I.e. manage a printed invoice, scanning into Business system. (Scanning a document to be routed to the business system). In this case the organization had a choice



to archive a scanned image direct in their business system, or enrich the scanned image via the enrichment server with a capturing solution adding meta data to the document and route the document to the document management system. In that case the standard APP will be extended with document capturing features(document will be enriched) Thus to make sure specific documents like invoices, contracts, confirmations, HRM docs will be archived and managed in the right location in the business system. Both the Application server and Document Enrichment Server work in the Cloud. Even Business systems like Exact, AFAS etc. are available cloud based.

Online application platform

The platform is located in the cloud to carefully target functions and adjust to customer/market needs. Ricoh is in charge of the licenses, distribution and management. Applications or functionality are hosted at a central server, maintained in one place, updated in one place, available for all Ricoh customers. The platform brings together a rich set of functions in a cohesive system that can be easily extended, as networks and application demands are constantly changing. System can quickly and cost-effectively adapt to various customer/market needs, as time to market is very important. All applications are running online, in the cloud; this avoids the customers to have the expense of infrastructure and headaches of software. Ricoh will have a growing collection of business applications which support customers to increase their business activities. The applications does not necessarily need to be Ricoh products, Ricoh is able to include these applications as well and host them.

RICOH



Data security

As organizations today worry about their electronic data, it is understandable the quite important data need to be protected, especially when the data is routed to the business systems via the internet.

The encryption of scanned Tiffs, PDF's etc. via Internet to the cloud platform is managed via https and secure FTP protocols. The Security of the data from the Document Enrichment Server on the Cloud platform (DM system) to the Cloud based or local installed ERP system is managed via a 128 bit encryption over https. After processing, all data will be deleted. Specific ERP system protocols are SOAP over https protocol and XML over https protocol.



Training, education, updates and upgrades.

Updates of the online apps on the MFD are automatically pushed to the device. The training for application I.e. WerkBox, can be done in the application itself. There is a so called learning Guide where all information is available. The screens from the MFD are intuitive and do not need further training. For future applications which might need specific training Ricoh provides user-at-work and/or online support through www.ricoh.nl.

Remarks

- Ricoh doesn't manage the critical business applications; this is the responsibility of the suppliers of the business systems.
- Webservers are being monitored 24/7 and MFD related questions will be addressed by a 24/7, helpdesk or on-site support during office hours.

Benefits for customers to work with a document capture system on-line/cloud based are:

- Low TCO, (minimum IT management required and energy consumption)
- Always the latest software editions
- Guaranteed continuity; Recovery & restore via Remote Configuration Services (RCS)
- Can be easily connected to the existing/preferred business system.(web based)
- Easy and simple management;
 - ➔ Self-managing features;
 - ➔ 24x7 Pro Active Monitoring;
 - ➔ Remote Management for System Fixes, Patch Management and Software Updates;
- Quick installation; Hardware and software parts are pre-configured; and there is a First installation Wizard.
- Easy and modular system. You choose what you need, the system can be expanded on line. The new requested modules will be added to the system in the cloud and pushed to the MFD. Meaning your "APP" will be added with new features on line.
- Green workflow, (on-line thus no travel and server is external)



10.8.5 Business applications

Application: Automation of HRM files

The main area everyone focuses on is invoices. (is about 75% of the applications) However, for many organizations it is important if the capturing of scanning solutions also supports other organization critical documents like HRM files and mailrooms.

We herewith would like to explain the application of a HRM solution based on the Ricoh cloud platform. International organizations and employment agencies are working nearly always from remote locations. One Headquarter and multiple (100 to 500) branch offices. The local branch office installs a MFD on which the employment application is running. The employment application is actually a APP which runs in the cloud and is pushed as a "button" and functionality on the MFD. This application scans and captures the personnel data like passports and diplomas and sends it automatically to the ERP system and customer/principal. There are two main requirements: 1. To connect the ID data to the employment file have to be done by law and 2. this have to be done quickly as the customer needs employees usually the same day.

How it Works.

Per application type specific apps are created in the on-line cloud solution and pushed as a buttons on the panel of the MFD. As soon as a new employee wants to sign in, all personnel documents like passports, diplomas and CV will be scanned by the employment agencies staff. One Action Flow will capture and process the data to the central archive-business system. From there the data can be retrieved or processed. Via e-mail the customer/principal receives the information of the relevant employee, if the customer is validating the contract and CV of the employee, if he agrees, the employee can starts directly (without wasting time) at the customer at the customer site.

The customer receives real time via e-mail an order confirmation and the employee receives the employment confirmation. The hour registration and confirmation, as well the invoice to the customer runs automatically out of the system to all relevant locations. In the past lots of copies and employment documents had to be managed manually at the employment agencies and at the customer side. Today this can be managed easily by One Action Flow on the MFD.

Another benefit for both the HQ and the local agency is the maintenance and service of the software. As there is no IT staff at the local establishments, the maintenance and support will be done remotely (via the cloud platform) and nobody have to worry about it, as the vendor manage this. The staff of the employment agency can now 100% focus on contact/relationships and business development.





Application: Archiving of meeting Minutes management of a Town hall

Digitalizing is the key factor to improve the quality of governmental services. The today civilians and companies-organizations want to be informed about the latest news/information. Additionally the requirements of governmental organizations in the promotion and use of digital information systems connects perfectly to the automation of business processes, like mail management, complaint management and minutes management.

Current processes are usually too slow, too expensive and inefficient to achieve the goals of the government.

Governmental organization starts working with One-Action Flow enabling the handling and digitalizing of the several type of minutes, files to the archiving systems, as well the retrieval of these documents and or multiple files.

How it Works:

Governmental organizations have many decentralize MFD/scanning sites. On each MFD –display are specific buttons created for specific scanning and filing applications. There is a button for scanning minutes, but also for scanning articles related to specific departments. The user selects the right button for scanning minutes, selects department and the One-Action- Flow OCR's the documents, capture the data and process the data to the electronic document management system. The document management system files the data and images to the right archiving system. Having meeting minutes in the archiving system, related articles, images, letters and drawings with the right document management systems, the handling of files can be done in a process-oriented way.

Another benefit is the ECM system can be connected to vertical applications like the handling of complaints, petitions and management support. Likewise complete records can be added to the digital agenda enabling each participant of a specific department can immediately look into it. The municipality may decide to publish the minutes and decisions immediately on the website. The government therefore is aiming to achieve a full e-window in which certain

information from the enterprise content management system feeds into a web environment. In figure above this is illustrated by the e-window of a town hall which can be updated with minutes of the ECM system.





10.8.6 Go-To Market model

The One-Action-Flow Cloud platform is launched by RICOH in the beginning of 2010, and it is a different model (Cloud based-SAAS) nearly all other vendors present. Therefore, for smaller organizations and organizations with a large number of decentralized offices, (i.e. employment agencies) an interesting and convenient opportunity. No IT hassles. Since the launch of this product suite, each RICOH MFD is engaged by One-Action-Flow capture.

The top reference accounts are:

- Unicef
- Portbase
- CARE
- Quirius
- EuroSystems

Reference account: Exotic Green employment agency

The Situation - Exotic Green is an international employment agency with subsidiaries in Poland Germany and in the Netherlands. Exotic Green wants to optimize their process as it cost too much time and money to enter the relevant data (passport, CV, and diplomas) in the system. The same time to retrieve data from a 24 meter archive cabin takes forever. Exotic Green wants the data storage managed in a digital uniform way.

The challenge - Exotic Green wants to manage the data storage in a digital uniform way. The same time the data entry need to be done decentralized into the central system. In other words, the staff of Exotic Green in the several departments/local establishments needs to enter the data (passports, CV and diplomas) directly in the central Database system. The staff in the local establishments need to be able to retrieve the relevant data, (CV or Diploma or passports, separated or combined) as a document or complete digital employment file.

The solution - The local establishment implemented a MFD. On the MFD will be implemented the remote employment application. Via the cloud/web the local establishment connects to the SAAS application One-Action Flow. Via the relevant button on the MFD (per application 1 button) the scanned documents will be offered to One-Action-Flow. This application OCR's and captures the personnel data like passports and diplomas and sends it to the ERP system. The solution results in a fast data exchange both internally, but also external (to customers and employees). It does not require internal server capacity for secured data filing, all documents and files are always online available and the system management and support is managed externally by RICOH



10.8.7 Summary

In 1995 Ricoh launched their first MFD. Since the launch and rapid growth of these MFD's Ricoh experienced in this box moving business a fighting market. Ricoh experienced to get more loyal and satisfied customers is adding value to the box. Therefore Ricoh starts supporting their customers with their business critical solutions in relation to the MFD 's. In this way Ricoh was much better able to serve their customers end to end. This concept was the bases of further developments of both hardware and software products. To make sure Ricoh distingue their portfolio in the market, Ricoh introduces more and more solutions to optimize and digitalize the enterprise and office market. Since the launch of Ricoh MFD's with interfaces and displays which can be connected to remote/web applications, the MFD became the center of the document management process.

The more the enterprises rely on critical business applications the more Ricoh understand the need for solutions which are easy to install, support, maintain, and use. Therefore Ricoh started to develop a CLOUD platform, which hosts the enterprise document management solutions and Scanning, capturing and processing solutions. Providing customers a SAAS based license model - the software is managed, serviced externally- the use is done locally. With the Launch of One -Action-Flow, RICOH is the first vendor of a SAAS based solution for scanning, capturing and processing. Large customers like ABN AMRO, and international employment agencies implemented One-Action-Flow supporting their critical data entry applications to their ECM and ERP system. Great benefits are the ease of use, the implementation time, the support and maintenance of these solutions. Based on the current integration model RICOH supports the customer needs to develop 1 button on the screen of the MFD which manages the required process. The actual intelligence behind the button; like scanning, OCR, capturing and processing will be managed in the Cloud. When the ERP system is also a SAAS solution (like Exact online or AFAS WEB), the user disposes of the data 24-7, any place and any time. The One-Action-Flow is often applied supporting digital archiving systems. With the connection to the SAAS based ERP system, the user can retrieve the data by file and by document any time and any place.

The CLOUD based SAAS solution One-Action-Flow is definitely a considerable solution when organizations do not have or able to spend IT resources and therefore would like to rely on the system support and maintenance of the vendor.

STRENGTHS

- SAAS and CLOUD based
- Managed and controlled from the panel if the MFD. Seamless integrated with the RICOH SAAS based ECM solution and SAAS based ERP vendors
- Via ECM solutions, RICOH covers the whole workflow of Scanning, capturing and processing
- Supports a green and sustainable workflow of document management.
- True Global presence by 150 country offices, global strategy. partners and 700 certified partners.
- With its background and long history in the office automation a recognized customer experience.



1.1 Innovation versus vendor – selecting the short-list

Creating a shortlist of the potential vendors is generally not a simple task. The process of creating the short-list is a lengthy process of research, finding relevant information, having conversations with peers, vendors, consultants, visit exhibitions and seminars, getting proposals, discussions, a Proof of Concept and price negotiations.

This time consuming approach can drastically be shortened by directly selecting a short-list which is based on answering the questions in this document and going through the selection matrices. With a short-list of two or three vendors directly a Proof of Concept approach can be agreed. The proof of concept will deploy the functional and technical requirements as became clear through the answered questions of this document.

During the Proof of Concept the price negotiations can take place. At the end of the Proof of Concept the deployment can directly start with the chosen vendor. A project time from idea up to an easy start of the deployment can take then between 3 to 6 months. The reality of this approach is confirmed by the benchmark references as discussed in chapter 10.

The process of building a short-list is supported by this report in a variety of ways.

- By answering the questions from this report a good insight is being established into the needs and requirements of the organization. Which business processes, document types, technical and functional requirements and needs, integration and innovations are being discussed?
- Reading through the vendor profiles with the product descriptions and the business applications which can be deployed.
- Using the below described selection matrices to support the selection of the potential short list vendors.

The selection matrices give an indication which of the discussed vendors gets a **preferred** position when compared to the described option in the selection area. Pointing out who will be a good **candidate** and who **basically** support the option.

The color coding is;

- Preferred vendors have a **green indication**.
- Vendors which are marked as a candidate have a **blue indication**
- The basically supporting vendors have a mark (✓) as indication.

The indications for preferred, candidate and basic are based on a combination of items. Not only the technique or features and functions have played a role in assigning the color coding.

The following items have also been taken into account.

- Price versus performance
- Professional Services and support capabilities in Europe
- Organization characteristics
- References and industry knowledge

There are seven selection matrices that can or should be filled in to get the short-list. With the eight' matrix the final calculation is done and the preferred vendors for the Proof of Concept are selected. Our recommendation would be to run



through each of the selection matrices and give the vendor some points based on the recommendation. 5 points when the vendor has a preferred status, 3 points when the vendor has a candidate status and 1 point when the vendor has a basic recommendation. Minus 3 points is used when the vendor has no preference for this option. Running through the selection matrices and select which items are relevant will lead to a total count where the vendors with the highest score should be on the short-list. Combined with the knowledge gained from the report questions, the vendor profiles and a prioritization of the selection items a well thought decision can be made.

Innovative application

The items that are mentioned as option in this matrix are the innovation applications as described in chapter 4 of this report.

1	Innovation	X if applicable	Applicability relevance	Innovation							
				READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
	Recognition and classification processing		100%		✓	✓	✓		✓		
	PDF/A as a scanning and archiving format		100%								✓
	The digital mailroom		100%					✓			
	Invoice processing		100%			✓		✓			✓
	Subtotal			0	0	0	0	0	0	0	0

Table 2 - Innovation - Selection Matrix

- Is there a requirement to route documents automatically into the business system as described in paragraph 4.4?
- Is there a requirement to work with one archiving standard, both intern and extern, as described in paragraph 4.3?
- Is there a requirement to digitalize the mailroom integrated with the business system as described in paragraph 4.5?
- Is there a requirement to align Scanning/capturing function with the business– e.g. invoice process as described in paragraph 4.6?



Industry

In what industry is the organization operating?

2		Industry		X if applicable Relevance		READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
		Finance & Insurance			100%								✓
		Healthcare			100%			✓					
		Manufacturing			100%	✓					✓		
		Retail			100%			✓				✓	
		Utilities and Telecom			100%			✓			✓	✓	✓
		Government			100%	✓	✓	✓			✓		✓
		Logistics			100%		✓	✓			✓		
		Legal			100%	✓					✓		✓
		Education			100%			✓		✓		✓	✓
Subtotal						0	0	0	0	0	0	0	0

Table 3 - Industry - Selection matrix

- When an organization operates in more than one industry, select the most relevant one – the industry where the innovative application will be deployed.
- Multiple industries can also be selected. It is advised then to set the “applicability relevance” to percentages which indicate the priority.

Deployment

Does it concern an implementation for one capture application at a department level or is it a corporate implementation with several applications and integrations? Is it an implementation of a business critical application?

3		Deployment		X if applicable Relevance		READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
		Point solution			100%	✓	✓						
		Desktop application			100%				✓		✓		
		Client server based solution			100%								
		SAAS based solution			100%					✓			
Subtotal						0	0	0	0	0	0	0	0

Table 4 - Deployment - Selection matrix

- Will it be a deployment a local scanning solution, or at a department, company or enterprise level?



- Will it be a centralized deployment or decentralized deployment across several geographic locations?
- The item "business critical" refers to a deployment where the document capture process and routing the documents to the business applications, needs to address a 100percent integrity and quality check. Absolutely no errors in the document capturing, processing and archiving are allowed. Extensive reporting and auditing is needed to comply with the compliancy regulations.

Technical architecture

The technical architecture can be a crucial factor in the final decision.

- When the organization has made a decision to start with a entry level solution with a growth path to a high end solution requires optimal integration and migration options.
- If processing/routing should be part of the document management workflow, to work via open standards and formats is a absolute requirement. This can have consequences in the selection process.
- When Archiving must be part of the ECM process. The added metadata, standard formats and connectivity needs to be a crucial part of the document capturing process.
- If the Document capturing, processing and archiving solution must be connected directly with the ERP/business system, the workflow/processing part must be able to talk 100% with the ERP or business system.
- In a number of organisations, the Document capturing, processing and archiving solution must be connected with a document management or enterprise content management system. In that case the capturing/processing part must be able to talk 100% with the ECM/DM system.

4

Technical architecture

	X if applicable	Relevance	READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
Scalable and modular (entry level - high end)		100%			✓			✓		
Routing/distribution as part of the doc.management		100%	✓			✓	✓			
Archiving as part of ECM system		100%				✓				
Connections with business applications		100%			✓		✓			
Integration with workflow DM/ECM		100%			✓				✓	
Subtotal			0	0	0	0	0	0	0	0

Table 5 - Technical Architecture - Selection matrix



Job characteristics

The job characteristics in volume, number of jobs, document types, SLA and KPI requirements all have influence on the required functionality.

- If there is a focus on large volume of invoices-documents which needs to be scanned, captured and processed to the back-end, business systems.
- Is there a focus on local department/office capturing process on the MFD (Small and midsize –up to 100K documents)
- Are the jobs processed typically in printed format?
- Are the jobs processed typically in Digital format (XML, PDF, TXT, e-mail)
- Does an e-mail attachment often need to be opened and captured?
- Is there a need for barcode recognition, in order to recognize receptions' like reply cards, HRM docs and logistic documents?
- Is there a need for document separation; I.e. Bulk scanning, capturing of documents with blank pages.
- Is there a requirement to check invoices versus purchase orders in ERP/business system automatically?

5 Job Characteristics		X if applicable Relevance	READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
High volume 100K+ production statement capturing-proc.	100%				✓			✓		
Office capturing processing via MFP	100%						✓			✓
Printed incoming documents	100%									✓
Digital incoming documents	100%			✓				✓		
Automated routing to ERP system	100%			✓	✓					
Barcode recognition for further routing (reply docs)	100%							✓		
Seperation of multi page documents	100%			✓				✓		
Automated checking of invoices versus PO in ERP	100%			✓	✓	✓	✓	✓		
Subtotal			0	0	0	0	0	0	0	0

Table 6 - Job Characteristics - Selection matrix



Business applications

The business applications deployed will have an important say in the selection. Which applications will be implemented on automated document capturing, processing and archiving level? Each of the business applications requires generic and specific functionality. Most of the discussed vendors can support the generic or basic requirements, but differences can exist at a specific level.

6

Business applications

	X if applicable	Relevance	READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
e-invoicing (electronic invoice management)		100%		V	V	V	V	V		
HRM filing		100%	V		V					
cargo/logistic documents		100%					V	V		
electronic patient record		100%			V			V	V	V
Document routing		100%			V					
Process automation		100%						V		
Digital archiving		100%	V		V	V	V			V
Audit trail complied with Sarbanes-Oxley act		100%			V	V			V	
Digital mailroom application incoming documents		100%			V			V		V
Electronic Data Interchange (peer to peer)		100%			V	V	V		V	
Scanning, capturing, processing aligned with business proc.		100%			V					V
Distributed capture and processing		100%			V					V
Connections with all ERP/business systems		100%	V	V	V	V	V	V		
Subtotal			0	0	0	0	0	0	0	0

Table 7 - Business applications - Selection matrix

- **E-invoicing.**
E-invoicing, not to be confused with scanning, capturing and processing of printed invoices. Invoices received in digital format like XML, PDF, text. These invoices are managed according EU standard.
- **HRM filing.**
The capturing, processing and archiving of HRM documents and personal information. How is the HRM data filed and how can this information be retrieved?
- **Cargo and logistic document handling.**
While most systems are capable to scan capture and process printed documents and PDF files, the difference is made by the ability to recognize the mix of printed, handwritten and digital documents. Cargo and logistic documents are usually a mix of it. Therefore to support the cargo and logistic applications it is a must to be able to recognize these data correctly.
- **Electronic patient record**
The electronic patient file must be connected with the document capture solution to be able to add the relevant data automatically to the patient record.



- **Document routing**
Is there a need for document routing based on meta-data extracted from the scanned documents?
- **Process automation**
To what extent can processes be automated. A process should include the Document Capture, classification, processing step, but also the routing/distribution integrated or as a 3rd party extension. What are the configuration options, user interface, auditing options and extension capability via scripting.
- **Digital archiving**
Is there a separate archival function for the storage and retrieval of electronic files. To what extent are multiple formats supported? Can data streams be stored entirely and be searched at individual document level? How is meta data used and stored? Is there functionality for full- text search? Can document be easily retrieved and re-inserted in the workflow, I.e. via the web 24-7?
- **Audit trail compliant with Sarbanes-Oxley act**
Is there a need to track and trace each individual document going through the process. For each of the steps a logging of timestamp, actions and result is maintained.
- **Digital mailroom application incoming documents**
To what extent the incoming mail have to be handled automatically. Automated mail opening and sorting. Distribute the printed incoming mail to remote (home) offices. Capture and classify the data to deliver a document/invoice direct into the AP process and ERP/Business system.
- **Electronic Data Interchange (peer to peer)**
High volume of invoices and delivery notes have to be exchanged between supplier and customer. The business systems (ERP) of the supplier and customer have to be connected via EDI connections to make sure the data will be delivered in the right format according international controlling standards.
- **Scanning, capturing and processing aligned with the business process**
The scanning of documents is aligned with a specific business process, e.g. invoice processing, mortgage request or purchase orders.
- **Distributed capture and processing**
Is there a need for a distributed scanning environment, with a centralized approach for processing.
- **Connections with all ERP / business systems**
Should the content capture and processing solution be able to connect, out-of-the-box, with various ERP applications or business applications?



Digital Mailroom components

This last selection matrix gives the components of a complete Automated Document capturing, Processing and archiving solution. It gives the option of selecting the items of the (theoretical) ADCPA structure which will be implemented. Items which are already present in the organisation and which will not be newly implemented can be skipped. Where a complete ADCPA implementation should have all components, an implementation of all components the same time, the First project, would not be advised. A realistic approach of what is needed or nice to have should be done.

7		Digital mailroom components		X if applicable	Relevance								
						READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
		Document scanning incoming documents			100%							✓	
		Datacapturing and recognition			100%								
		e-mail attachments handling and capturing			100%			✓	✓		✓		
		Document routing process			100%			✓	✓		✓		
		Archiving and retrieve			100%								
		Control and Reporting			100%			✓	✓		✓		
		Subtotal				0	0	0	0	0	0	0	0

Table 8 - Digital Mailroom - Selection matrix



Result

As a result the totals score. As an option the priority(or relevance) column can be changed by giving it a specific value which is more appropriate for the organization. The value of priority will be multiplied by the value of the item in the vendor column. The two (or three) highest scoring vendors are the preferred vendors for the innovation the organization is pursuing.

R		Total	Priority / Relevance	Matrix values							
				READSOFT	NUANCE e-Copy	NUANCE OEM X-solution	ABBYY	KOFAX	RICOH	Nsi Autostore	MEDIUS
Innovation			4	0	0	0	0	0	0	0	0
Industry			1	0	0	0	0	0	0	0	0
Deployment			3	0	0	0	0	0	0	0	0
Technical architecture			2	0	0	0	0	0	0	0	0
Job Characteristics			2	0	0	0	0	0	0	0	0
Business applications			4	0	0	0	0	0	0	0	0
Digital mailroom components			3	0	0	0	0	0	0	0	0
End total				0	0	0	0	0	0	0	0

Overall shortlist selection		
Readsoft	✓	0
Nuance e-copy	✓	0
NuanceOEM X-solutions	✓	0
ABBYY	✓	0
KOFAX	✓	0
RICOH	✓	0
NSI Autostore	✓	0
MEDIUS	✓	0

Table 9 - Selection matrices - Overall result

As an alternative method in creating a vendor selection shortlist the categories are used to create three values which represent.

- Technology fit
- Business fit
- Innovation fit

The technology fit score is compiled by adding the categories, workflow, job characteristics and Digital Mailroom components.

The business fit is compiled by adding the categories, industry, deployment and business applications.



The innovation fit is the result of the category innovation.

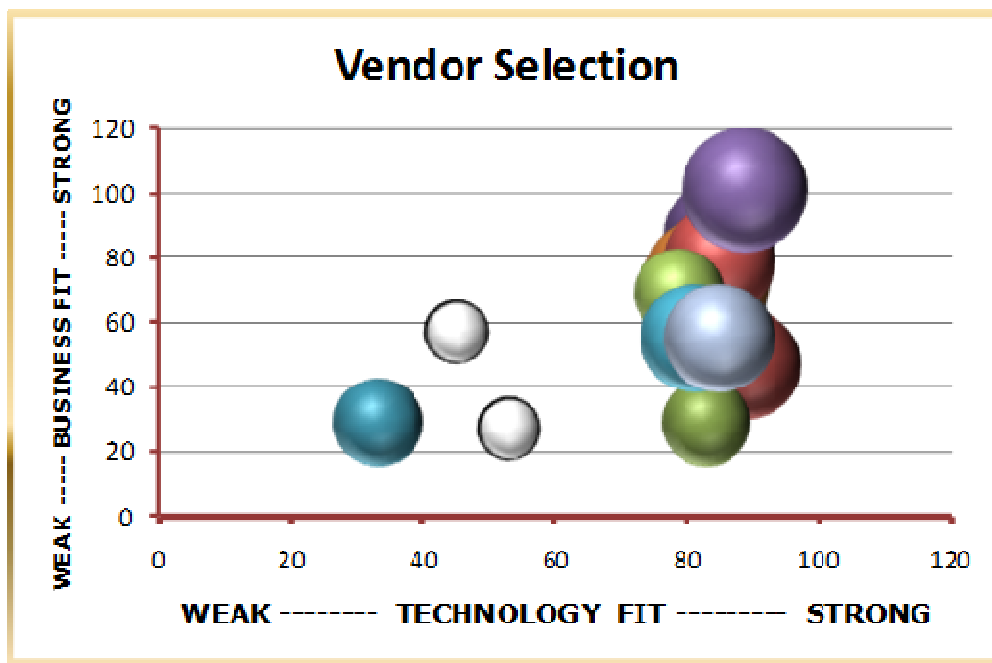


Table 10 - Selection matrices - Shortlist

Each of the bubbles represents one vendor. The size (diameter) represents the fit from an innovative perspective. The X-as represents the fit from an overall technology perspective. The Y-as represents the fit from a business solution perspective. By evaluating both graphics a well thought decision can be done in selecting the short list vendors.



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Telephone: +31 (0)6 50734796