Input and Response Management (ECM)

YOUR PATH TO INTELLIGENT PROCESS AUTOMATION

Performance

Quality

Speed

Efficiency

Cost

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Executive summary

Input Management still presents a major challenge to mid-size and large organizations that need to process large volumes of text-based business transactions on a daily basis – transactions that rely on input received by mail, e-mail and the Internet. Only companies that adopt a solid digital mailroom approach that analyzes, understands, and automates all incoming mail will manage to successfully control this growing flood of information.

With the staggering development of the Internet, digital communication (e-mail, Web) plays an integral role in today's input management, and an even more dominant role in tomorrow's input management. In recent years, companies have been able to substantially reduce their processing costs per business transaction by implementing response management solutions for these digital communications. Digital mail is fast, easy to deliver, and can be processed and responded to automatically, provided one uses a smart approach.

By contrast, handling conventional mail has become quite inefficient. In addition to the burden of logistics and paper storage, the numerous manual steps make handling letter mail very expensive. What's more, transferring document content to data systems – and on to further processing – not only requires you to switch media, but spend a significant amount of resources capturing data.

Therefore, paper-based transactions (incoming mail) represent a substantial potential for decreasing cost. They also provide companies with an opportunity to design service processes around customer value.

With intelligent use of auto-adaptive methodologies – capable of learning from the behavior of human agents who classify and process information – businesses can effectively realize such cost savings. They can also generate dynamic, administration-free knowledge from this learning. Organizations that adopt a solution that uses this knowledge to execute recurring data processes, with a maximal rate of automation, can catapult input management into optimal efficiency.

Kodak Alaris strongly believes that automating paper-based transactions (incoming documents) presents an enormous potential for decreasing costs. It also gives companies the opportunity to design service processes around customer value, rather than just cost reduction. This whitepaper outlines approaches from the real-world practices of mid-size to large companies that are significantly reducing the cost of handling their text-based customer communications.

Capturing documents – generating data: optimization opportunities for processing incoming mail

In today's marketplace, processing incoming mail is a critical challenge within any organization's day-to-day business. Every day, companies receive thousands of pieces of customer correspondence by letter, fax or e-mail. Orders and purchase invoices trigger merchandise management processes. Contracts and product descriptions need to be distributed and shared. Claims must be evaluated and processed.

Understanding and processing relevant content and customer data as well as its secure and efficient transfer represents one of the most important goals of a company. Why? Because this business data is the lifeblood of a modern networked organization.
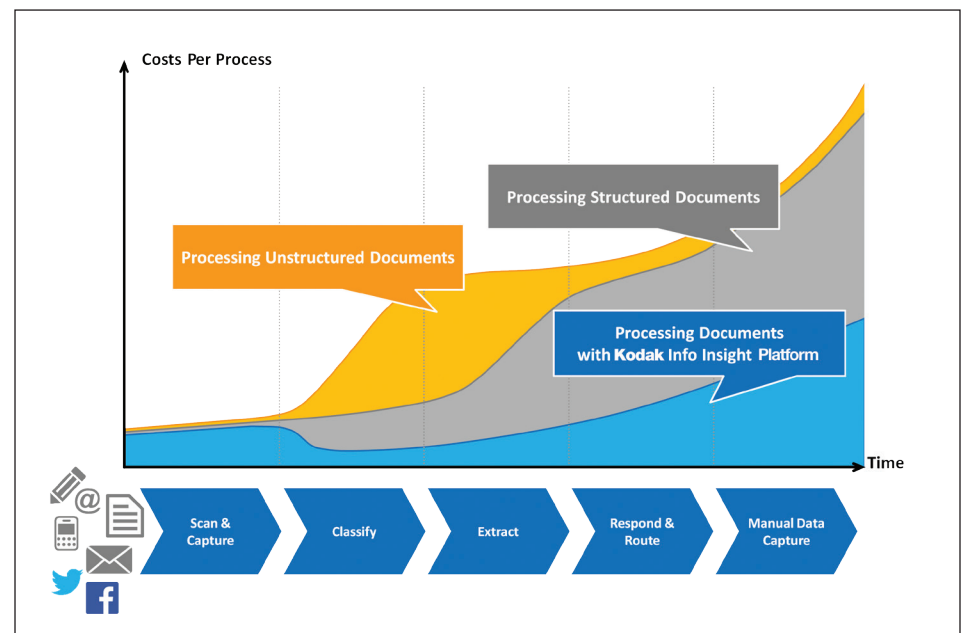

Fig. 1: Relatively insignificant actions at the beginning of the mail handling process can lead to significant cost disadvantages by the end of processing.

Companies across all industries have made progress in digitizing mailroom procedures. Most have taken document logistics into the digital world and developed archiving procedures that comply with legal requirements. They have created special applications for processing invoices and forms. However, most companies still haven't fully tackled the challenge of a true, and all-encompassing "digital mailroom." Many document-based processes still depend on manual labor.

Common inadequacies of conventional mailrooms:

- Correspondence is read, sorted, and distributed multiple times

- Correspondence is checked for completeness, then "patched up"

- Correspondence gets lost, or is searched or sorted incorrectly or inefficiently

- Processing requires switching media: search/archiving takes place in third-party systems

- Processes, volume, and performance rates are not transparent

Valuable resources are consumed by solving the same daily core processes over and over across the organization's landscape. An organization easily invests between $8 and $20 in the transfer of a single piece of correspondence by the time the underlying business transaction is resolved.[1]

Aiming for efficiency, knowledge and quality

Looking at the complete process, it quickly becomes apparent that processing *unstructured* information (e.g. customer letters) is particularly expensive. However, processing costs are comparatively low for processing *structured* documents (e.g. forms that have a known layout and content) and *semi-structured* documents (e.g. purchasing invoices that do not have a common layout, but do contain a defined metadata set). Determining both the type of business transaction (*classification*) and the data required to process the transaction (*extraction*) happens at the beginning of the process. Achieving high-quality results through targeted process automation at that first stage will exponentially increase the achievable efficiency for further processing steps.

To evaluate the potential for automating mail processing, note the following:

1. Optimizing classification and extraction processes creates huge efficiency opportunities.

2. Extracting customer data and content in real time while handling incoming mail yields valuable information as part of your ECM (Enterprise Content Management) strategy.

3. Relatively small efforts to avoid mistakes at the beginning of the mail handling process can have a huge impact by the end of processing.

Now that we have uncovered the "flaws" of conventional incoming mail processing solutions, let's discuss obvious efficiency potentials.

Efficiency potential 1: Artificial Intelligence (AI)-based knowledge (classification and extraction in auto-adaptive system environments)

Many manufacturers, integrators, and solution providers offer software or hardware components for operating small, mid-size, or large digital mailrooms – each with a different emphasis and varying characteristics. Virtually all of them rely on a classification concept that is strictly rule-based. Such solutions rely on searching by keywords or keyword combinations, and quickly reach their limitations when processing unstructured text (letter, e-mail, etc.). This yields ambiguous OCR (Optical Character Recognition) results. Rule-based input management results in procedures that are unnecessarily complex. It requires constant checking and optimizing, and cannot meet the adaptability needs of today's business dynamic.

On the other hand, the best mailroom solutions apply dynamic, self-regulating classification methods for all document types and forms. Using AI methods, these leading-edge solutions can recognize text patterns and contexts or compare content with sample texts within fractions of a second. Based on dynamically weighted probabilities, they make decisions about the type of an event as well as the known specifics about a person or case. These methods help minimize error rates for mail processing. Such scientific methods have successfully been applied in response management applications for e-mail or knowledge management for a decade and have steadily improved over that time.

1 Dr. Gerhard Wohland & Matthias Wiemeyer „Denkwerkzeuge für Höchstleister" – Wie dynamikrobuste Unternehmen Marktdruck erzeugen," Verlag Mumann / ("Intellectual Tools for High-Performers – How Dynamic-Robust Organizations Create Market Pressure")

Engineering common knowledge: the dynamic automation of recurring processing steps

In truly productive installations, AI-based mailroom solutions can reach accuracy rates of 95 percent and higher, thereby doubling the average volume of auto-sorted documents that conventional mailroom solutions can typically handle. Furthermore, virtually no administrative intervention is required. The most intelligent system self-optimizes by integrating behaviors of select specialists (knowledge workers) as they evaluate and extract information into the knowledge base. In other words, the system "learns" how to handle documents correctly. This is called an "adaptive system environment."

In the context of the theory of dual value added, adaptive system environments are capable of recognizing recurring processing patterns and "learning" the everyday knowledge these select agents have gained in handling content. Thus, the systems emulate the behaviors of the best staff members – in an effort to engineer their behaviors.

By 2008, industry benchmarks had already proved that adaptive system environments in modern input management could achieve accuracy rates for recognizing events and content clearly superior to those in conventional rule-based processing. For inter-organizational ECM processes, input management solutions can not only classify content, they can extract information from categorized documents and automatically route it to any third-party system for further processing. This occurs via graphically controlled workflows, thus making it irrelevant whether information is extracted from structured, semi-structured, or unstructured documents. The latest auto-adaptive methods operate with the highest reliability, solely on the level of text-based information.

Adaptive system solutions can be combined with most relevant conventional mailroom solutions without having to alter or abandon existing system architectures. They significantly increase efficiency by overcoming the inherent weakness of conventional mailrooms: the dependency on human resources for evaluating and preparing content.

From a strategic viewpoint, adaptive system environments represent the foundation of modern input and response management for all text-based content on an ECM platform. This is where the transition from a conventional mailroom to a digital mailroom should start for managing all incoming written communications.

Efficiency potential 2: Customer-value-oriented processing (enriching mail processing with case-specific data)

Another significant obstacle in handling incoming documents, e-mails and text messages in the conventional way is that the necessary data isn't available to process information in the organization's data management systems. Instead, the staff member responsible for the transaction has to manually intervene to complete the information. Some examples:

- **Inquiry regarding an order:** pull up the customer/order record manually in the ERP (Enterprise Resource Planning) system
- **Changing master data:** search for the customer in CRM (Customer Relationship Management), open data entry mask, change data
- **Claim:** search for the customer in CRM, ascertain data and enter ticket into claim management system
- **Customer history:** add the incoming transaction to CRM customer history
- **Order:** transfer data by dragging and dropping it into the system to create a new order

Transactions like these are now regarded as standard procedure. They are described in detail in process manuals and are routine for any knowledge worker who handles incoming correspondence. Any increase in productivity would generally be limited to organizational measures – or to outsourcing the task to an external service provider with inexpensive per-unit costs. Ultimately, automation potentials go undiscovered.

Access to all data: optimizing each individual processing step

The latest input management systems are configured to enrich individual processing steps in workflows for specific, recurring business processes with the data needed at the time of processing.

Some 60 to 80 percent of transactions can usually be handled through pre-defined, standard workflows. Data enrichment can deliver significant efficiency gains. Industry experts estimate that up to 40 percent of work hours spent on verifying and transferring document content into IT systems could be eliminated and replaced with adaptive system solutions running at optimal efficiency.

However, it is even more important to focus on the opportunity for customer-value-oriented processing. It's based on the principle that creating positive service experiences for particularly "valued" customers has a profitable effect on customer loyalty and referrals.

If your company can identify those 20 percent of customers who are responsible for 80 percent of the brand loyalty and revenue at the time a transaction is processed, you will be able to execute the transactions that are especially important for your business in ways that positively influence the transaction to your advantage. Social CRM, which emphasizes the degree of consumers'

influence on many other consumers through real time communication on social networks, is vitally important in customer-value-oriented processing and should be included in the design of future ECM architectures.

Kodak Alaris' whitepaper "Creating Intelligent Customer Service Experiences" specifically highlights the phenomenon of strategic interaction management based on the "networked customer."

Efficiency potential 3: Automation and error prevention (how to determine the optimal degree of efficiency)

Moving forward, the balancing act between cost efficiency and quality will continue to be a constant challenge for future input and interaction management between organizations, their customers and suppliers. Companies can master this balancing act if they can determine – and operate at – the optimal degree of efficiency with the help of intelligent analytics. A requisite for this step is the solution's ability to map out decision probabilities based on cognitive methods, in order to specify which processing steps should automatically be completed. The implemented solution must also be capable of making calculations based on sample learning sets to ascertain valid statements about error rates.

Quality vs. cost pressures: controlling error rates

This latest generation of AI-based input management solutions offers a matrix for this very purpose. The system is "fed" with information using learning sets. With these learning sets, real time simulations can be conducted that show a degree of automation dependent on maximal error probability for identifying and processing specific types of transactions. Basically, you are determining how many errors will occur during automated document classification if the classifier's sensitivity is reduced. The advantage: management can now decide, for each process, how many errors are acceptable during automated processing in order to achieve a desired degree of automation – and to accomplish the accompanying cost savings.

Let's compare this concept to product manufacturing: increasing the speed of the assembly line will inevitably lead to a noticeable decline in production quality. By figuring out the "optimal degree of efficiency," management can make ad hoc decisions for each product series regarding the number of rejected products they are willing to accept in order to optimize productivity.

Summary

The Internet brought with it a paradigm shift in the way consumers communicate with each other and with companies. It altered the accepted concept of conventional mailrooms. Documents going hybrid is increasingly common now. But electronic letter mail will certainly not banish snail mail from mailrooms within the next few years. However, one thing is evident: investing in conventional solutions that are solely designed to process structured (e.g. forms) or semi-structured (e.g. invoices) content is becoming less and less profitable.

Digital mailrooms must inevitably merge with customer service operations. Measures to increase the loyalty of business partners, as well as customers, should be a top management priority. The only place to implement them is at the point of customer interaction: communications at branch locations, by phone, by e-mail and conventional letter mail, by text message, and on the Internet.

The time has come for a strategic reorientation of service-based processes between organizations and the market. While conventional mailrooms will not disappear overnight, the time is right for measures that will position a company to take on the challenges of the decade ahead. These challenges include cross-channel orientation and targeted automation and acceleration. Market demands are driving these changes. The organizations that achieve success during the next decade will be the ones that embrace and act on the trend toward strategic interaction management.

Five key recommendations for making your current mailroom processing more cost efficient

1 *Create a centralized knowledge base: adaptive, AI-based, across all contact channels*

While interest and excitement continue to build regarding the profitability of digital mailrooms, other technically feasible options are still being developed. It is true for rule-based system solutions, which search for keywords to classify processes, that in order to achieve an optimal degree of efficiency by today's standards you need to expect high design costs. Unstructured documents, in particular, require highly complex rule sets that can become enormous and confusing. They don't follow any dynamic and they continually need to be adjusted. By the time a false classification is noticed, rule sets are adjusted and a process is restarted, valuable time has been lost. A great knowledge base is auto-adaptive – meaning it is capable of optimizing itself based on daily observation. Its contents are subject to rules and permissions. Plus, it is centralized so that it can also be applied for e-mail and **Twitter** inquiries, for example, or suggestive responses in the Web FAQ system. Leading AI-based system solutions integrate with existing mail processing solutions through Web services. The knowledge base becomes the foundation of your input management. It can and must be applied to all existing and future system constructions.

2 *Create one workflow platform for processing all input sources*

Another challenge lies in consolidating multiple systems that are optimized for different document formats (structured and unstructured documents) and document types (e-mail, letter, online FAQ, etc.). All have to be maintained, mastered and managed. What to do? Implement uniform procedures. Modern communication platforms are not restricted for use in mailroom environments. Efficiency rates for classifying and extracting unstructured content (e.g. e-mail in running text) and structured content (e.g. e-mail from a Web form) greatly exceed those of conventional mailrooms. Content from social networks (**Facebook** and **Twitter**) should be supported as well.

3 *Optimize OCR results with virtual optimization methods*

Mistakes made at the content capture stage of the mail handling process can lead to significant costs and a loss of quality further down in the process. If your OCR software generates false data, all subsequent measures to enable automated processes will be rendered ineffective.

We suggest using virtual optimization methods, especially if you want to process communications from different sources (fax, letter) and formats (forms, free-form text). These methods compare the results of multiple OCR systems and move the "most likely" data (as determined by the latest voting mechanisms) on for further processing. Therefore, it is essential that you make sure you "get the most out of" your documents.

4 *Implement extraction approaches to enrich input management*

Features that identify customers (name/address fragments, customer IDs) as well as content specifications (product names, order numbers) are crucial to processing efficiency. When processing individual customer transactions, all relevant data should be available on the agent's screen at the moment of handling the transaction. This is true for validation tasks (e.g. assigning a message to inventory data), as well as for data entry (triggering a case-concluding transaction in existing systems). Important: you should be able to define for each processing step which data is needed for handling the transaction at that point. Leading technologies are even capable of learning extraction behavior from agents and can process free-form text documents automatically.

5 *Set the stage for customer-value-oriented processing*

Reliably identifying personal and organizational data, and conducting a fuzzy search for matching characteristics, will be very important for the input management of the future. This reduces the potential for errors and improves subsequent processing, as it supports classification (customer history), processing (transaction data), and archiving. It becomes even more important when a company wants to implement customer-value-oriented processing: you will be able to prioritize depending on CRM customer features, or a customer's social characteristics. You can find tips on customer-value-oriented processing in Kodak Alaris' whitepaper "Creating Intelligent Customer Service Experiences."

About Kodak Alaris' Document Imaging Division

Kodak Alaris' Document Imaging solutions enable customers to capture and consolidate data from digital and paper sources, understand and extract valuable insight from the contents, and deliver the right information to the right people at the right time. Our offerings include award-winning scanners, capture and information management software, an expanding range of professional services and industry-leading service and support. With customers ranging from small offices to global operations, Kodak Alaris delivers superior systems and solutions to automate business processes, enhance customer interactions and enable better business decisions.

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