ICC ISSUES BRIEF

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Automation of Document Examination under Documentary Credits

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Current Situation, Purpose and Scope

Decision-makers in financial institutions ("FIs") recognise that a potential gap exists between current manual document examination activities under Documentary Credits ("LCs"), and evolving digitalisation and automation in other areas of trade finance.

In addition, it is clearly acknowledged by those involved in international trade that there is a distinct necessity towards increased automation and that such progress is inevitable.

Accordingly, improved understanding is required in terms of what can be done with the new technology. Recent developments in Artificial Intelligence ("AI"), Machine Learning ("ML") and smart Optical Character Recognition ("OCR") are increasingly becoming driving forces behind automation in trade finance. For example, OCR technologies have improved significantly over the last few years thanks to significant advances in machine learning.

In accordance with the agreed mandate, the ICC Banking Commission continues to identify ways to overcome obstacles and major constraints in respect of the wider adoption of digitalised trade.

As part of this work, ICC is now analysing the use of the above technologies to automate the examination of documents within trade finance.

This paper aims at providing guidance to decision-makers in FIs, who are interested to understand more about automating the document examination process.

It provides an overview of various levels of automation and analyses the numerous opportunities and potential challenges when automating the examination of documents presented under an LC. It is likely that the outcome can be further applied to other types of trade finance instruments such as standby LCs and guarantees.

Although regulatory compliance requirements such as Anti-Money Laundering ("AML"), Counter-Terrorist Financing ("CTF") and Know Your Client ("KYC") fall outside the scope of this paper, the technologies discussed are considered also suited to delivering insights on behavioural patterns and anomalies.

Introduction

Current manual document examination is time-consuming, labour-intensive, and requires skilled and experienced staff.

The work itself is primarily paper-based, necessitating manual examination of, in the main, paper documents. These types of processes, particularly in a world coming to grips with the impact of a pandemic, are incongruous to the needs of FIs and corporates in terms of digitalisation, automation and reform.

Despite numerous digitalisation efforts, the Trade Finance business is still regarded as a hugely paper-intensive and cumbersome process with an estimated 4 billion pages of Trade and Trade Finance documents being in circulation[1].

Document examination under LCs is a specialist function involving intensive manual scrutiny by professional and experienced human document checkers. Becoming such a professional can take several years, necessitating thorough commitment from the individual to demanding manual work, and is also a significant investment for the FI. Locating and placing staff into such roles, as well as retaining existing staff, has already, and will increasingly, become more difficult and costly.

In addition, the manual effort can instill a detrimental impact upon the scalability of the LC business as well as hindering the evolvement of document examination. This, combined with scarce professional resources, may hinder the development of automated and streamlined solutions.

Recent innovation and achievements, wherein the intrinsic capabilities of AI and ML allow learning by doing, facilitate the usage of such technology in respect of document examination. It makes sense for FIs to proactively follow what is currently happening in the market and analyse how the new technology can be used to their advantage.

The advantages can be significant as outlined below in '4. General Observations'. The world of LCs will not remain in a 'paper' status quo wherein all processes are manual.

This document is a first step in guiding participants into the digital age of document checking. Ultimately, by an indeterminate date, all documents will be digital, but there will be a period of paper and paper/digital hybrids along the way. As such, it is important that those involved take conscious positive steps in the right direction. Without these technologies, progress will be far slower and costly, both in terms of resources and financial considerations.

A survey was sent to all ICC members in June 2020, with a request for information on their current document checking activities of which over 60 have responded—a summary of results is included in the below appendix.

Levels of Automation

Recognising that automation is a journey and every organisation is at different phases, a matrix has been developed, similar to the classification used for self-driving cars[2], where different levels of automation involved in the document examination process have been defined.

The lowest level has no automation and the highest level encompasses a completely automated process without any human intervention.

Achieving a certain level of automation in this process broadly depends upon two key aspects:

1. the ability to correctly classify and extract data from paper documents, and
2. to subsequently utilise the extracted data to determine a complying presentation.

The matrix is progressive, so a higher level of automation relies on the sum of the technologies from the previous levels and delivers the totality of the automation. The targeted aim should be level 4.

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1 ICC Global Survey on Trade Finance, Global Trade - Securing Future Growth, 2018
2 https://www.sae.org/standards/content/j3016_201806/

LEVEL	NAME	DESCRIPTION	TECHNOLOGIES	CAPABILITIES AND OPERATIONAL RISKS ADDRESSED
0	No Automation	Entire document examination process is executed manually using paper documents.	> None	> Challenge to find skilled specialists to handle manual document examination in mid-/long-term. > Slow document checking process. > Restrictive option for a material E2E process development. > Common rules and standards, but interpretations can vary with limited possibilities to improve the process globally. > Continued high discrepancy rates on first presentation despite rule revisions. > Consequences of work-from-home periods.
1	Document Imaging	Paper documents are scanned, and the document examination process is executed manually by a human based on the scanned images.	> Scanning	> Document Examination can be performed at a location separate from the receipt of presentation location
2	Basic Automation	The scanned images are processed by OCR and Data Capture and the results are used to support the document examination process by automating simple tasks or reducing data entry. A human is actively involved in all steps of the digitisation and document examination process.	> OCR > Document Classification > Data Capture > Robotic Process Automation (RPA) > Simple rules with NLP to reduce false positives	> Extraction of party names, countries, ports, dates, amounts, currencies, etc. > Reading of structured messages, such as SWIFT MT 700 to determine baseline data set > Check document consistency based on a literal comparison of values > For example, applicant & beneficiary details in invoice literally match LC > Basic matching of documents to LC > For example, names and ports literally match LC

LEVEL	NAME	DESCRIPTION	TECHNOLOGIES	CAPABILITIES AND OPERATIONAL RISKS ADDRESSED
3	Partial Automation	The process largely automated and supervised by a human. Only certain critical parts of the document examination process are manually executed.	> Complex rules > Analytics > Machine Learning > Natural Language Processing (NLP)	> Identification of document type; e.g. invoice, bill of lading, air waybill, etc. > Ability to read cover letter and SWIFT MT 700 field 46a (Documents Required) and assign the number of originals and copies > Check if all documents stipulated in the LC have been presentedNonliteral comparison (examples): — Any port in China = Shanghai — Port of Shipment in LC: Amberes vs Port of Shipment in B/L: Anvers — B/L mentioning "Packing may not be suitable for sea transport" = clean, or B/L mentioning "Packing not suitable for sea transport" = not clean. — Goods description on invoice not in the same order as in the LC > Articulation of straightforward discrepancies or reasons for refusal e.g.: LC expired, late shipment, late presentation, overdrawn, etc.
4	High Automation	The entire process is automated, and a human is only involved to handle exceptions when requested to intervene by the system.	> Deep Learning > Almost standardized process	> Comprehension of non-standard clauses in LC and on documents, e.g. "LC number and contract number should not be mentioned on documents other than invoice and transport docs" > Full review and gap analysis of all UCP 600 rules and ISBP 745 practices > Ability to articulate discrepancies that are 'non-binary' in nature; e.g. content of a document includes a detrimental statement that would constitute a discrepancy; Data conflict based on analysis of differing verbiage across different documents. > Ability to read handwritten documents
5	Full Automation	Entire document examination process is standardized and executed STP without human intervention.		

General Observations and Benefits

There may still be a belief that FIs can only rely on human knowledge and experience in document examination and that this is unlikely to be replaced by AI and ML in the very near future. However, solutions already exist which clearly support the use of technology to hugely improve the efficiency of manual work.

It is understood that in the pursuit or consideration of automation in document examination, decision-makers in FIs may consider issues such as budget, risk appetite and consequences for employees.

It is noted that whilst a standardised and fully automated approach may be viewed as desirable for the future, there may also be various models and gradual levels of automation that different FIs will adopt first. However, as mentioned above, whilst it is expected that at some point all documents will be digital, there will be a period of paper as well as paper/digital hybrids along the way.

An experienced document checker will not only examine the documents for compliance with the terms and conditions of the LC and applicable rules, but may also possess the intuition to detect possible red flags with regard to fraud or AML.

Such knowledge may also be considered indispensable when a bank needs to communicate with beneficiaries or other banks with respect to discrepancies in a transaction. It may be a concern within FIs that such knowledge and experience will diminish over time if document examination is performed in an automated fashion.

However, it should be recognised that, when automation reaches the higher levels, systems will also learn and will be capable of applying similar in-depth analysis and accumulated knowledge which would be comparable to, and ultimately beyond that of, an experienced document checker. Until then, reliance can be placed upon these systems for the document examination aspect, whilst allowing LC experts to concentrate on the discrepancy process.

Whilst it is acknowledged that certain trade-offs may occur if FIs proceed with automating document examination, the potential gains and benefits of automation are likely to heavily outweigh any negativity and ought therefore to be seriously considered; these benefits may enable future digital evolvement whilst including:

> Increased standardisation in terms of document checking criteria among banks. This will pave the way for further digitalisation and automation, for example in document preparation by corporates and third party logistics. Standard interpretation of ICC rules will add value to all involved parties, as well as speed up the E2E process significantly.

> Explicitly and unambiguously supporting the use of digital/electronic records/documents, thereby extending the mitigation of risk from a paper environment to the electronic milieu.

> The implementation of automated document examination will accelerate the transition from paper to electronic documents. Trade Finance and LCs in particular are still recognised as the remnants of a paper world. A cross-fertilisation between automated document examination and producing documents will stimulate the production of electronic documents thus also reducing the carbon footprint.

> Experienced document checkers can concentrate on where they are needed the most, i.e. handling potential discrepancies based on system feedback rather than needing to go through the full checking process and all the submitted documents. In effect, the experienced users will be consuming the data efficiently. As systems increasingly support new document checkers, the threshold to become an experienced document checker may be significantly lower in the future. This enables banks to more easily attract potential candidates for such business expertise as well as providing additional savings to banks.

> Automated document checking will also help to make data more accessible and transparent. The ability to data mine statistics around the documents presented by a beneficiary, problems that arise with certain types of documents (such as transport or insurance documents), the

number of discrepant sets of documents and types of discrepancies, should also help financial institutions to increase the quality of the documents presented and provide better support to their customers.

> Working in line with the ICC Guidance Paper covering recommendations for a simple documentary credit format will be a natural complement to automated document examination (refer to section 5 below).

> Moving towards conformity and congruence as opposed to divergent local, national and regional practice.

> Explicitly and unambiguously supporting the usage of digital/electronic records, thereby extending the mitigation of risk from a paper environment to the electronic milieu.

> The aggregation of data for any FI to really analyse their business flow and make objective business decisions with strong MI reporting.

> Advanced and shared understanding of terminologies and common objectives.

> Increased confidence in a set of independent and guidelines.

> Uniformity, consistency and standardisation in customs and practice.

> Enabling and supporting trade finance between regions and countries regardless of underlying economic and judicial structures.

> Supporting an updated legal infrastructure by replacing requirements for paper documentation with digital documentation, and simplifying/decreasing bureaucracy.

> Documentation reform by prioritising and accepting digital rather than paper-based documents and establishing a repository of best practices to promote paperless trade.

> Increased understanding and usage of ICC electronic rules, in particular eUCP version 2.0.

> Lower operational cost via increased scalability to handle LC volumes, as FIs are currently constrained by the size of their operations teams and trained document checkers.

> More holistic and structured systems including: electronic images of paper documents, searchable digital documents, identifying data patterns, enabling compliance checks and improving regulatory compliance.

> Opportunity to localise operations instead of outsourcing to lower-cost jurisdictions. This could result in increase of LC knowledge by staff in more locations.

Less spurious discrepancies.

Documentary Credit Formats

A recent initiative by the ICC Banking Commission providing guidance notes for documentary credit formats[3] perfectly complements automation. This paper provides clear and transparent recommendations in respect of the optimal approach required in order to achieve a straightforward, uncomplicated documentary credit format.

However, it should be noted that, whilst usage of a standardised LC formats certainly aids and enhances automated document examination, it is not a pre-requisite.

Draft standard templates for the most commonly-used documents have been mentioned many times as a necessity. Whilst this is an admirable aim, this is not the focus of this paper.

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3   https://iccwbo.org/publication/guidance-notes-for-documentary-credit-formats/

Document formats are often developed by particular industries and are not mandated by the ICC. That said, as with LC formats, it is not essential in order to benefit from automated document examination.

As automation continues to push boundries, advanced machine-learning techniques and AI now allows for accurate data extraction and document review without the need for standardisation.

We no longer need to standarise to automate!

In addition to aiding automation, a simple LC is a value-added option in well-established relationships between an applicant and a beneficiary.

As mentioned in the guidance notes, an applicant and a beneficiary should carefully consider the documents required for presentation, by whom they are to be issued, their data content and the time frame in which they are to be presented. LCs must not include wording that is ambiguous or subject to more than one interpretation, nor should they state conditions for which fulfilment cannot be ascertained from the face of a document. Only documents that are necessary (e.g. for customs clearance purposes) should be required by the credit.

Regulatory aspects

Specific regulations for use of AI is an emerging topic in many jurisdictions. As an example, the European Commission published a draft EBA regulations on Artificial Intelligence on the 21st April 2021, wherein it states a conclusion that new legislation specific to AI may be needed to make the EU legal framework fit for current and anticipated technological and commercial developments.

Pillar I of the Basel III Framework is about minimum capital requirements for risks. Operational risk is included, but there is no mention of automated document examination, and no regulation about automation in general. If automated document examination is considered as a type of outsourcing, some guidance can be found in the "Principles for the Sound Management of Operational Risk" of the Basel Committee on Banking Supervision, June 2011, which describes outsourcing as '"the use of a third party, either an affiliate within a corporate group or an unaffiliated external entity, to perform activities on behalf of the bank".

This definition could be interpreted to include automated document examination if the tool used is provided as a service by a third party. Effective risk management policies and practices ought to be in place, and these include processes for conducting due diligence in the selection of potential service providers, establishment of an effective control environment at the bank and the service provider, and development of viable contingency plans.

In this respect, the [Basel] framework has advice such as encouraging the bank's management to look carefully at outsourcing arrangements. A bank should also have an integrated approach to identifying, measuring, monitoring and managing technology risks.

More is to be found in Principle 9 which states that: Banks should have a strong control environment that utilises policies, processes and systems; appropriate internal controls; and appropriate risk about how to report items on a bank's balance sheet regarding outsourcing (fees, number of employees involved, etc).

However, as mentioned above, nothing specific about Automated Document Examination is mentioned. At a minimum, organisations should ensure that existing risk management policies are extended to include new solutions surrounding automated document checking.

Summary

As stated by many practitioners, there is no doubt that the world of LCs will not remain in a 'paper' status quo wherein all processes are manual.

It is acknowledged that automation will significantly streamline overall LC processes.

In order to ensure validity in a fast-moving and evolving environment, it is critical that organisations act in a proactive manner and consider what can be achieved utilising document examination automation under LCs with the help of technology such as AI, ML, and OCR.

There is already real potential to reach a level of automation using available and emerging technologies to realise tangible benefits.

Considering the potential benefits, FIs are encouraged to explore how automating the document examination process could reduce cost and reliance on manual processing in their specific context. There is also potential for Corporates (LC beneficiaries) to benefit, for example from an automated document examination as a precheck before presenting their documents to the bank.

Full automation within the current constraints of paper-based transactions with non-standardised and unstructured data is understandably a challenge to all. However, should initial steps not be taken towards automation, we will not realise the full benefits.

We also need to be clear on what level of automation is achievable with today's tech. Will it enable a bank to get to level 3 or 4 or perhaps only level 2? A large part will also depend on how committed FI's are to automatiom. Innovation is all about breaking barriers and Fintechs will need the support of FI's in all aspects including use cases, data and UX feedback. Only then can automation move to level 4 over a period as FI's and Fintechs work collaboratively to make a real difference to trade processing by achieving the maximum level of automation.

As such, we encourage ICC national committees and members to be open in their thinking. Close co-operation will ensure speedy solutions.

The objective of this paper is to understand how we can collaborate to make a difference and encourage our members to work together in this emerging area. As an organisation, we can provide benefit by being proactive rather than reacting to developing circumstances.

Conclusion

Automation will significantly streamline LC processes overall. It is believed that studying available options, considering different capabilities and commencing preparations into this direction is essential.

As digitisation continues to evolve, automated document examination will become the new normal as financial institutions learn to trust and understand how machines work and the consistent approach that this brings to the review.

Automated document examination will continue to evolve as it needs to. All ICC revisions and changes to UCP 600, ISBP 745, eUCP Version 2.0, guidance papers and ICC opinions are continually addressed and reviewed by firms offering such services. The concept of shared learning ensures all 'subscribers' benefit from all changes on a continued basis—ensuring an up-to-date approach to reviews.

Financial institutions can gain multiple benefits aside from the obvious efficiencies from automation. Areas such as operational risk mitigation, stronger audit trails and access to 'data at your fingertips' are also critical aspects of automation which makes this a 'must have' and not a 'nice to have'.

We remain open to feedback and comments as ICC continues to work throughout 2021 in order to communicate, educate and support all members in better understanding the benefits and simplicity of automating document examination.

Any comments should be sent to Tomasch.kubiak@iccwbo.org

Glossary of terms and definitions

TERM	DEFINITION
Analytics	A process in which a computer examines information using mathematical methods in order to find useful patterns
Anti-Money Laundering (AML)	The laws, regulations and procedures intended to prevent criminals from disguising illegally obtained funds as legitimate income.
Artificial Intelligence (AI)	A subfield of computer science concerned with the ability of a digital computer to perform tasks commonly associated with intelligent beings
Automation	To execute a task without any human intervention.
Complex rule	An evaluation where the outcome is expressed as a probability.
Counter-terrorist financing (CTF)	The laws, regulations and procedures intended to prevent the financing of terrorist acts, and of terrorists and terrorist organisations.
Data Capture	The extraction of structured data from text.
Deep Learning	A subfield of machine learning in artificial intelligence that imitates the workings of the human brain and is capable of learning unsupervised from data that is unstructured.
Digitalisation	Using digitisation to improve a business process.
Digitisation	The process of converting information from a physical format into a digital one.
Document Classification	The classification of a document based on the image or text.
E2E	End to end
Know Your Customer/Client (KYC)	The requirement to verify the identity, ownership, control, suitability, and risks involved with maintaining a business relationship.
Machine Learning (ML)	A subfield of computer science and artificial intelligence concerned with computer algorithms that improve automatically through experience.
Natural Language Processing (NLP)	A subfield of computer science and artificial intelligence concerned with the interpretation of human (natural) languages by computers.
Optical Character Recognition (OCR)	The identification of printed characters in an image using software.
Robotic Process Automation (RPA)	Instruction based automation of simple repetitive (data entry) tasks within an overall business
Scanning	The process of converting a document into digital form for storage or processing on a computer.
Simple rule	An expression where two or more values are evaluated using one or more standard operators.
Straight Through Processing (STP)	Execution of an entire transaction, from initiation to final settlement, without human intervention