

Humans Intelligence

Empowering Financial Crime Prevention Teams through Augmented Intelligence

A Whitepaper written in partnership





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Introduction

We are in the midst of an artificial intelligence boom. With the large-scale adoption of Al tools on the rise and accelerated by the COVID-19 pandemic, financial institutions (FIs) are turning to automation and machine learning to enhance their business processes, including financial crime compliance.

From Know Your Customer (KYC) and identity verification to customer screening and risk ratings — Al's ability to help streamline and optimize controls has quickly made it an invaluable tool for compliance teams. For example, transaction monitoring — a regulatory requirement — relies on the assessment and analysis of customer interactions and information, both historical and real-time. Methodically recognizing network effects, patterns, or synchronicities at scale to find suspicious transactions requires an automated function capable of assessing extraordinary amounts of data. Since human brains are simply not fit for such purposes, this extensive analysis is best done by Al.

Due to its incredible capacity, AI can revolutionize certain financial crime control areas and has been embraced by many firms. In the UK, two-thirds of financial service firms responding to a 2019 Financial Conduct Authority survey said they already used machine learning, a subset of AI¹. A July 2022 poll of a global FinTech membership organization showed that 60% of firms were either currently using AI or considering implementing it in the near future. However, despite this enthusiasm, there is still a lingering perception of AI as an intimidating black box. Often viewed as unexplainable and mechanical, AI can feel stifling to humans. Its opaqueness not only gives AI a feeling of unapproachability, but also poses a potential problem as regulators require a clear explanation of controls. Additionally, if AI is not managed correctly, it may cause vulnerabilities or operational difficulties.

However, a close look at how to use AI in the financial crime field can dispel many common concerns and show how it can be a meaningful part of a firm's controls. This white paper looks at strategies for making the most of AI adoption. It explores best practices for AI setups while simultaneously empowering your people by enabling them to have more of an impact, develop professionally, and enjoy more rewarding and engaging work.

¹Financial Conduct Authority, 2019



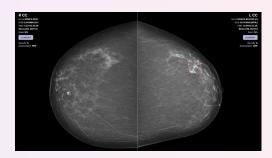
Combining artificial and human intelligence

To produce the best results for fighting financial crime, humans and Al must work together in tandem. This reflects the concept known as 'augmented intelligence' (also referred to as 'human Al' or 'contextual Al') which can broadly be summarized as the use of technology to supplement and support human intelligence, with people remaining at the core of the decision-making process. The benefits of combining artificial and human intelligence have been observed in various fields including cancer diagnostics (see text box below). Using both deep learning and human analysis results in fewer errors than either method used on its own. Augmented intelligence can be strategically measured and monitored against organizational key performance indicators, so the value it adds can be clearly demonstrated. While artificial intelligence in itself refers to the performance of cognitive tasks by technology, augmented intelligence sees technology as an aid, rather than a replacement, to human intelligence. It uses software to extend cognitive abilities like memory and sequencing, perception, anticipation, problem solving, and decision making. Augmented intelligence explores how humans and Al complement each other, compensating for one another's weaknesses and completing tasks that would be unachievable separately. To achieve the best possible balance, understanding where Al is better utilized than human intelligence and vice versa is a necessary first step.

Case Study

Strengthening human processes through Al

Radiologists examining mammograms miss 1 in 8 cancers, with fatigue, overwork, and time of day all impacting accuracy. A large-scale 2022 research study published in The Lancet
Digital Health directly compared an Al's performance in breast cancer screening, comparing when it is used alone or in assisting a human expert.
When Al was used to directly replace a human reviewer, it was less accurate than a radiologist. However, when a so-called "decision-referral approach"



was used, with AI used before and after a radiologist review, the overall results improved, and nearly three-quarters of screening studies didn't require review by a radiologist. These findings support the adoption of a

²The Lancet, 2022



collaborative Al-radiologist approach to improve screening accuracy and reduce radiologists' workload.²

This complements the findings of a 2016 MIT study on identifying breast cancer, which found that combining deep learning with human pathologists' diagnoses reduced the human error rate by approximately 85% - an impact that can lead to a big increase in early cancer detections and lives saved. Since the mid-19th century, the primary tool for manual diagnosis was the

microscope - with procedural shortfalls including a lack of standardization and lengthy manual reviews analyzing millions of cells across hundreds of slides. The research highlights the power of integrating deep learning into pathologists' workflow for significant improvements in accuracy as well as greatly improved efficiencies. Notably, the errors made by the deep learning system did not generally correlate with the mistakes made by humans, showcasing their complementary nature.³

Benefits of Al

For starters, it is useful to identify there are different types of cognitive tasks which require different types of thought processes. With larger processing power and memory capacity, computers are particularly good at assisting with **convergent thinking**. This means they are well-suited to solving complex calculations and rules-based activities or games and assessing probabilities. Conversely, human brains are excellent at **divergent thinking** - the ability to think creatively to generate numerous potential answers from any given problem or set of questions.

Convergent thinking

- Uses memory, logic, and pattern recognition
- Ability to answer questions 'correctly' where a single right answer exists
- Emphasizes accuracy and speed

- Divergent thinking
- Ability to imagine numerous solutions to a single question
- Ability to brainstorm and think creatively 'outside the box'
- Ability to draw unexpected connections



³ Wang et al., 2016

To combat financial crime, AI has the following relevant strengths and abilities:

Continuous learning. Al can learn by incorporating continuous feedback from human users, using this feedback to refine its algorithms within seconds. The symbiotic relationship between Al and its users enables the system to become more intelligent, adaptable, and efficient and improves the platform's functionality, user interface, and capabilities to detect financial crime.

Identifying abnormalities. All can scan large data sets and easily pinpoint outliers, deviant cases or locate patterns. This is especially useful for identifying suspicious transactions or irregular behavior hidden in pools of millions of rapid-fire transactions. Additionally, All can identify patterns in vast data sets that humans cannot readily see, locating networks of actors and transactions that may shed light on criminal activities like money muling, which often involves multiple small transactions of equal amounts.

Automating tasks. All can automate routine and straightforward tasks, saving time and reducing human error. Automating tasks frees up time for analysts so they can perform more value-added analytical work, reducing the need for front-line human review.

Case Study

Customer Risk Assessments (CRA)

The traditional model for CRAs is based on static data points. There is often minimal data for new customers, and information is updated only periodically. This means the assigned risk level between updates may be inaccurate and rigid. In the traditional model, human analysts are limited by how accurately and flexibly they can assess risks. Firms can use AI to move to a model of 'perpetual KYC', making CRAs dynamic and up-to-date and utilizing all available data at all times rather than a limited set of data at fixed points in time. For example, a customer who had a low risk score upon onboarding may interact with suspicious or previously

flagged accounts, prompting a change in their risk score. These continual reassessments based on material changes in activity and behavior provide more precise CRAs, capturing risk more accurately. In a similar vein, Al can also enable a perpetual KYC model, furthering accuracy. An agile, Al-powered CRA model can detect new risk indicators through emerging patterns of unusual behavior in ways that an exclusively human-driven model cannot. Importantly, by improving overall efficiencies, it can also lead to the allocation of resources on these more complex customers.



Benefits of human decision-making

The human brain has some notable advantages over Al. In addition to social and general intelligence, a human's ability to perceive and understand the world around them in a more tangible way is vital for contextualizing and effectively fighting financial crime. Some notable strengths include:

- **Contextualizing and judging.** Humans can employ context, abstract thinking, and analysis to judge and evaluate behaviors. Since financial crime tasks are not tick-box exercises performed by rote, humans are best at conducting holistic analysis and making the ultimate decision on any escalated alert or case.
- Employing critical thinking skills. Humans can use their unique ability to think creatively and employ imagination and common sense to develop new solutions. Good investigators need critical thinking skills and the ability to observe, imagine, synthesize and reflect.
- Utilizing real-life industry experience. Humans can bring invaluable financial crime expertise, industry knowledge, and nuanced understanding that AI tools cannot replicate. Lived experience concerning typologies, behaviors, and judgments are irreplaceable, as are humans' unique abilities to communicate with each other using complex and detailed language.

Case Study

Transaction monitoring

Undoubtedly, AI is more efficient than people at analyzing large amounts of data and identifying patterns and networks. However, humans comprehend the world differently, and in ways that can complement AI. Consider significant world events that may trigger certain unprecedented transactional activity or unexpected behavior (e.g. the COVID-19 pandemic or the Russia-Ukraine war). Humans understand and interpret these events



differently than machines, as they can immediately use their knowledge of what is happening outside the data ecosystem to understand and



explain what the events mean, how serious they are, whether they are likely to change in the near future, etc. For example, when the pandemic first emerged, there was an overall increase in bank note withdrawals sparked by consumer panic. As people became accustomed to the situation, transactions became more digital. This also impacted street drug dealers who were previously cash-intensive. To adapt to this reality at the start of the pandemic, dealers set up grocery delivery companies for their drug business. Human analysts would have been able to recognize this behavior in context and explain immediately the

emotionally-driven reasons for WHY it was happening, offering different insights to Al. They would also be able to analyze an uptick in food delivery services and critically question their activity, using other data sets like demographics and corporate records. Al can also predict and adapt to changes in behavior, including more diffused or smaller-scale changes that may elude a human analyst, and are able to find the key data reason provided the data is available to it. Ultimately, the two complement each other, teasing out different elements to provide a holistic view.

While AI continuously improves at specific skills, it cannot replicate human insight. Additionally, since machine learning continuously learns from human actions, decisions, and institutional practices, human input in technology development remains fundamental.

Fighting bias

All humans have conscious and unconscious biases informed by lived experience and cultural and societal factors, and there is a danger that these may be replicated or even magnified by Al systems if left unchecked. Al systems learn to make decisions based on training data, which may be unrepresentative or incomplete, and which may include biased human decisions skewed by preconceived ideas or historical or societal inequalities.

When looking at financial crime controls specifically, unconscious biases can lead to unfair customer outcomes. Preconceptions regarding certain nationalities, ethnicities, age groups, geographical locations etc. can result in the uneven targeting of certain individuals or entities, or the creation of risk profiles that result in financial exclusion.

Both human and Al biases require conscious effort to recognize and address, but if Al developers are aware of the problem, they can take proactive remediation



steps. A study by the Brookings Institution states that operators and creators of Al algorithms "surfacing and responding to algorithmic bias upfront can potentially avert harmful impacts⁴". The global money laundering and terrorist financing watchdog, the Financial Action Task Force (FATF) also recognizes that considered human input can reduce Al bias in relation to financial crime⁵.

If challenges relating to algorithmic bias can be addressed, Al offers distinct advantages in achieving less discriminatory outcomes. It is ideal for drawing impartially on multiple data sources and avoiding anchoring bias - a psychological phenomenon where humans rely disproportionately on the first piece of information given to them (for example, forming unfounded opinions based on a customer's name). It also helps iron out individual biases, ensuring consistency across a team and ensuring no one person with particular biases has an undue impact on any specific decision.

The Brookings Institute study sets out a framework for 'algorithmic hygiene' which identifies some specific causes of biases and best practices to identify and mitigate them. These include diversity-in-design: the employment of diverse work teams and cultural sensitivity within the decision-making process, the use of cross-functional teams, both human- and machine-led bias detection strategies, and formal and regular auditing of algorithms to check for bias.

The good news is advancements in AI are increasingly tackling this issue. The field is more and more attuned to the notion of explainability, i.e. the ability of users to understand how an AI system works and to interpret the outputs. Being able to look under the hood of an AI model and interpret and challenge the outputs can help developers and users ensure model accuracy, fairness, and transparency in AI decision-making.

Ultimately, there is an ethical component to how AI bias is considered. While there are undoubtedly proven weaknesses to human decision-making, the Brookings Institute study concludes that, "While it will not always be possible to satisfy all notions of fairness at the same time...fairness is a human, not a mathematical, determination, grounded in shared ethical beliefs. Thus, algorithmic decisions that may have a serious consequence for people will require human involvement." This also echoes the European Union's GDPR regulation⁶, which demands human decision making in addition to any automated systems when it comes to decisions that significantly impact a human.



⁴Brookings Institute, Algorithmic bias detection and mitigation: Best practices and policies to reduce consumer harms, May 2019

⁵ FATF, Opportunities and challenges of new technologies for AML/CTF, July 2021

⁶ Regulation (EU) 2016/679 (General Data Protection Regulation)

User experience and usability of Al tools

Though sometimes overlooked, usability is a vital feature for any software platform, including those for anti-financial crime teams. Technological tools are meant to make analysts' lives easier, ultimately optimizing workflows and increasing efficiency. A report by the IT company Softek stated that the greatest reported benefit of using Al tools was an increase in productivity (40% of respondents) followed by a reduction in operating costs (28%)⁷.

While FIs often prioritize user experience (UX) for their customers by ensuring online banking apps are streamlined, intuitive, and aesthetically pleasing, the same attention is rarely found in the tools that support their staff. This often overlooked feature in the financial crime space is frequently due to the use of legacy systems, which seldom implement a clean and modernized UX. Yet UX is an essential factor in the timely detection, assessment, and reporting of financial crime as it streamlines relevant information so that a team can more easily focus on detecting and assessing unusual activity.

Good UX is vital for any successful AI tool. Overly complex tools that are not user-friendly impact efficiency and can even alter the makeup of a financial crime team, resulting in the hiring of multiple skill sets of data scientists and compliance professionals. To avoid overcomplication and employ an augmented intelligence approach, AI developers must start by understanding the use case and problem statement their tool is designed to solve, i.e. starting with the users not the technology. Any projects which develop AI tools in a vacuum and then impose them on a financial crime team in a top-down manner are likely to fail.

For financial crime analysts, having modern, agile, and intuitive software can save time and help facilitate a better investigation, leading to better regulatory outcomes for the FI.

Contextualization

Humans are hard-wired to understand narratives and stories, with some research suggesting the biological basis lies within the brain's architecture⁸. Stories strengthen neural connections and allow our brains to function in a more complex and unified manner. To work with the brain's architecture is to have an interface

⁸ Brainworld, 2020



⁷ Softek, October 2019

which paints a picture from data points, thereby creating the outline of a story for analysts to make connections more easily. For example, instead of awkwardly placing vital pieces of a customer's information in multiple spreadsheets or platforms, an integrated system with a purposeful layout showcasing data in intuitive visualizations (i.e. reflective of the customer journey and a multi-layered view of customer, products, channels, and transactions) can help expedite an analyst's investigation, allowing them to spend more time engaged in critical thinking rather than fetching pieces of information.

A well-designed augmented intelligence tool will bring together multiple sources of information while simultaneously surfacing all relevant information and excluding irrelevant information to give the analyst a clear picture and a definable narrative. A tool that is designed to contextualize information should thus prioritize presenting the right information to the right people at the right time to aid their decision making process.

Customization

While united by our affinity for storytelling, science shows that individuals tend to process information differently.⁶ On a financial crime compliance team where analysts are tasked with investigating suspicious transactions or accounts, allowing individuals to create a workflow that best serves their process is imperative. For instance, while some analysts favor double-checking the sourcing of information throughout an investigation, others may find this interrupts their flow and would prefer to wait until the end. Additionally, some analysts prefer looking at graphics, charts, and figures first, while others favor plain text. While these individual preferences may historically seem frivolous, having flexible software that allows analysts to look at different pieces of information in different ways is in fact fundamental to supporting their efforts and promoting a productive and enjoyable work environment. This has been evidenced by the performance gains seen in consumer applications.⁷



⁶ Washington University in St. Louis, 2018

⁷TrueList, 2022

⁸ HR Dive, 2017

Engagement

Easy-to-use tools make anti-financial crime work more efficient and rewarding, which leads to better engagement and retention. Financial crime compliance is often likened to finding a needle in a haystack - the aim of a good Al tool is to remove the overwhelming majority of the 'hay', or irrelevant alerts that plague legacy systems. According to a report by Microsoft, a staggering 95-99% of banks' transaction monitoring alerts are false positives. Processing this number of false positives creates 'muscle memory' where analysts fall into a pattern of rejecting alerts, making it difficult to spot the tiny percentage which do relate to illegal activity. It is also demotivating - many analysts sum up what they've done at the end of the day with "I sorted through and rejected a lot of unnecessary alerts". They are not looking for, engaging with, or being rewarded for finding actual instances of risk or suspicious behavior. Cutting through the noise to generate more meaningful alerts increases analysts' engagement and accuracy, and minimizes fatigue and burnout.

A clean interface with engaging visualizations makes it easier for analysts to holistically identify information from multiple sources and see connections between customers and networks faster. As visuals can help present information more effectively than long-form text, providing graphics can help analysts extract critical data for senior decision-makers while delivering an accompanying comprehensive report for a fuller picture. In terms of AI tools, it is important that the interface helps make the AI explainable - not from a technical perspective but from a human one, so the analysts understand what the outputs tell them.



Navigating multiple proprietary legacy systems and different investigative tools, each with different UX nuances, can have a detrimental impact on the efficacy of intelligence production and investigative output. There is a very real risk that by transitioning from system to system, pertinent data will be lost. In turn, these failings can prejudice the core judgments and key recommendations on how to proceed.



- Former intelligence manager at a major global bank



⁹ Microsoft, 2018

The bottom line

Combining human decision-making with AI, and adopting a clean and easy-to-use interface all add to one crucial result: improving your business' bottom line. Considering these elements will create an exceptional return on investment on the AI software your anti-financial crime team uses.

According to an authoritative textbook guide to software engineering, the return on investment of a good UX ranges from \$2 to \$100 for every \$1 invested.¹⁰

Improving engagement and retention is important for a firm's success, as turnover can cost 33% of an employee's annual salary, and engaged teams reportedly show up to 59% less turnover. Employing intuitive and effective tools means staff spend less time on laborious and routine tasks, giving them more opportunities to focus on critical thinking and utilizing their expertise. In a competitive talent market, this is an essential consideration for all FIs. Moreover, humans are only productive for a finite amount of hours per week, and assigning them to manual tasks that do not make use of their unique skills is wasteful.

Al's ability to increase productivity and reduce the time and cost spent on performing certain tasks is an invaluable feature during economic uncertainty or challenging business conditions. Instead of downsizing, firms can use Al to shift people's time from repetitive tasks to more productive and value-added tasks.



Al is not about replacing your people. It's about making your people better and getting them more engaged. A lot of that is around user experience. Many companies have become really good at building great experiences for their customers, but users of internal tools haven't always received the same level of attention. Analysts spend 8 hours a day looking at the systems you've built them. The better you can make it for them, the higher the engagement and less turnover you'll experience. You'll keep great people, get to train them further, and you won't suffer from an outflux or drain of knowledge leaving your business..



- Jan Philippaerts, VP Ops Strategy and Execution, Currencycloud

¹² Gallup, 2017



¹⁰ WSoftware Engineering: A Practitioner's Approach, Bruce Maxim & Roger S. Pressman, 2019

¹¹ HR Dive, 2017

Empowering your people to empower your business

To succeed and be profitable, FIs must empower their staff through engagement and collaboration.

Making work meaningful

Whether it's stopping wildlife smuggling, human trafficking, or issues related to global-reaching events like COVID or the Russia-Ukraine war, anti-financial crime work is vital for making the world a better place. It is closely tied to current affairs, and analysts should ideally feel empowered by their important work in reducing criminal activities and human suffering. When anti-financial crime workers spend time on activities and tasks that truly matter, their jobs can feel incredibly rewarding and engaging. Since the field is multi-faceted and constantly changing, there is ample room for staff to learn and develop new skills, creating an even more engaging working environment.



Working in FinCrime brings the exciting pursuit of a perfect balance between strict regulation and commercial ambition. Automation tools and AI are essential for me as a force multiplier, streamlining monotonous but still hugely important routine tasks. From a simple automated monitoring system, to complex pattern recognition algorithms, automation allows more focus on the really impactful aspects of preventing FinCrime - helping stop the suffering it brings to unsuspecting victims, the proliferation of criminal activity, and even terrorist attacks. Each victory, however small, is impactful and something to be proud of. It sets criminals back, even if just by an inch, and that is hugely important



 Dinu Popa, Head of Compliance and MLRO at a UK business banking FinTech

However, particularly for junior analysts, day-to-day work using legacy tools can often become mundane and repetitive, removed from the real-world impacts of financial crime. The intelligent, effective use of Al eliminates the bulk of these everyday and repetitive tasks. It links KYC information or transaction data to larger patterns, making it easier to see the bigger picture and the criminal activity underneath. This technology allows analysts to use their own knowledge, expertise, instincts, and critical thinking to piece together the puzzle in an



intellectually stimulating way. When their work is more effective, analysts can feel satisfied and motivated, knowing they are making a tangible difference in detecting and reducing financial crime and making an impact through their work.

Teamwork and collaboration

Technology and AI can help make a positive impact through effective and meaningful information sharing. Clever and innovative systems can better facilitate organization-wide collaboration, an increasingly important factor in making antimoney laundering and counter-terrorism financing measures effective and thus creating value for the whole business¹³. Teams must not work in silos and FIs must cooperate to share relevant information internally for business benefits and externally for better real-world impact.

Platforms that use advanced technology and machine learning to improve information sharing can help ensure that analysts have the information they need to tackle financial crime threats across FIs and networks, while also elevating their value within the FI.

Conclusion

Al is not only becoming more popular and witnessing more widespread adoption, it is also firmly on the radar of regulators and international standard-setters. Increasingly, regulatory and industry guidance note the importance of technology and Al in combating financial crime threats. For example, in 2021 the European Banking Federation stated that the "future of AML is rooted in the use of innovative technologies¹⁴". Yet industry guidance still highlights the need for "governance, explainability, and model performance monitoring", seeing technology as "a complement to systems" rather than a replacement for human-powered compliance.

Al's ability to catch more instances of financial crime while improving efficiency means all FIs need to seriously consider strategies for implementation. If used correctly and with careful thought, Al can provide excellent return on investment



¹³ The Wolfsberg Group, Effectiveness through Collaboration, July 2022

¹⁴ European Banking Authorities, Demystifying Al for AML, October 2021

¹⁵ FATF, Opportunities and challenges of new technologies for AML/CTF, July 2021

and enable safe, risk-mitigated growth. Augmented intelligence combines AI with human intelligence in an approach that plays to their respective strengths, leading to better anti-financial crime efforts and improve productivity and the bottom line.

In addition, a good AI tool also empowers financial crime analysts, making their jobs more rewarding and meaningful. Instead of replacing human inputs, the right AI tools can enable you to empower your firm and your people.

About Lucinity

Lucinity is on a mission to promote augmented intelligence — the synergistic use of what machines and humans do best. Human Al empowers human ingenuity and creativity with the data processing and analysis prowess of machines. We believe in using Al responsibly and positively, leveraging the best of both worlds to tackle financial crime.



Lucinity's Transaction Monitoring

Detect suspicious activity and behaviors with an easy-to-use interface designed around its users. Al findings are organized and presented in a single view of the AML case to multiply your team's productivity.



Lucinity's Actor Intelligence

Get a 360-degree view of your customer and deeper insights all in one place. Don't rely solely on static and self-reported KYC to determine your customer's compliance risk. Actor Intelligence continuously and automatically updates your customer risk scores based on their actual behavior.



Lucinity's SAR Manager

Streamline your suspicious activity reporting with one customizable platform to easily organize, review, validate, and file SARs.



Meet the team



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Theresa Bercich
VP of Product



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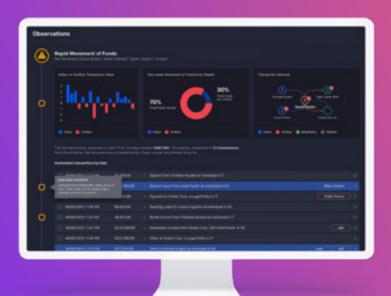
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