AI AND ML APPLICATIONS IN FINANCE

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A sectorial approach to address the opportunities and challenges of AI

Any process or decision that is data-driven can be automated or streamlined using artificial intelligence (AI). For a sector such as insurance, where data is the raw material and data analytics is the main working tool, it is not surprising that AI will play a central role in the digital transformation of the sector.

Opportunities: using AI across the insurance value chain

AI systems are being used in insurance to automatically triage claims and determine their complexity, urgency and potential fraud risk. This can speed up the claims management process for simple property damage or medical claims, for example, by extracting relevant information from documents (such as medical bills), verifying coverage and calculating settlement amounts.

In the area of pricing and underwriting, some insurers are also starting to use AI to process satellite imagery and other new sources of information to better underwrite natural catastrophe risks and more efficiently address the risks posed by climate change. From a sales and distribution perspective, insurers are using AI to inform marketing campaigns and provide more tailored advertising and discounts. AI is also being used to assist agents in determining the "next best action" during the sales process.

While the above use cases are all noteworthy and are already being used in the sector, the step brought about by the large language models that recently hit the headlines around the world shows that we are arguably only seeing the beginning of what AI can do for the sector and for society as a whole.

Adoption of AI also brings risks that need to be addressed

While AI has the potential to bring many benefits, it also poses significant risks. Many of these risks are not new, but the inherent characteristics of AI can exacerbate them. One of the main risks relates to bias and discrimination; AI systems can inherit or learn biases from the data they are trained on, which can lead to discriminatory outcomes that disadvantage certain groups.

The opaque operation of some AI algorithms (sometimes referred to as the black box effect) also poses significant challenges, particularly in customer-facing applications where consumers may need to be provided with sufficient information to make informed decisions or have access to appropriate redress and accountability mechanisms.

From another perspective, the automation and sophistication of certain tasks will also imply changes for the insurance workforce, which will need to adapt and receive adequate training to be able to use AI to support their work and mitigate challenges.

Policy response in highly regulated sectors such as insurance

The widespread adoption of AI raises a number of questions for regulators and supervisors. First and foremost, do we need to adapt regulatory frameworks to the technological advances brought about by AI? If so, how should this be done?

The AI Act aims to establish new rules for the development, deployment and use of AI systems in the European Union. These ex-ante measures will be complemented by the AI Liability Directive, which will ensure that consumers have access to adequate redress mechanisms in case of harm. EIOPA welcomes these legislative proposals and supports their objectives and principles to promote the ethical and trustworthy use of AI in the European Union. However, legislation such as the AI Act has the complex task of integrating provisions into existing sectoral regulatory frameworks. In the case of insurance, the sector is already highly regulated and the application of the AI Act is likely to cause some friction.

Indeed, when insurance companies and intermediaries use AI today, they are not doing so in an unregulated space. A number of legally binding instruments at international, European and national level already apply to the use of AI in the insurance sector. The insurance sector has certain specificities that deserve special attention in any cross-sectoral legislative proposal, such as the role of actuaries in the supervision of underwriting risks, which does not exist in other sectors. In addition, insurance supervisors, who are being trained on new technologies and business models through initiatives such as the Digital Finance Academy, already have extensive experience in supervising mathematical models in insurance and should continue to do so. EIOPA has also recently launched a new market monitoring survey on digitalisation, which will, among other things, gather further evidence on the level of adoption of AI and the governance measures that insurance companies are developing around it.

EIOPA recognises the challenges posed by complex AI systems and the need to promote the responsible use of AI. EIOPA stands ready to develop further guidance to the sector. However, rather than creating new, often overlapping rules, we strongly believe that this should be done building on existing sectoral requirements for governance, risk management, conduct of business and product oversight and management.

TSVETELINA PENKOVA

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Opportunities and challenges for effective and secure financial solutions

The finance industry is going through significant transformation pressure – the players in the sector should adapt quickly if they want to stay competitive in the fast-paced market environment. AI and other disruptive technologies have the potential to boost the financial sector and transform the way services are being delivered. It is quite logical that many of the data-driven innovations are originating exactly from the financial sector.

From fraud detection, easier access and more tailor-made financial products to personalised client service, artificial intelligence (AI) and machine learning (ML) are rapidly changing the way the financial services sector operates. Several main requirements must be respected when talking about AI and ML integration into financial services.

Primarily, data security and privacy are the most crucial elements. In order to provide insights and financial predictions, AI and ML largely rely on enormous amounts of sensitive data. Thus, safeguarding that data from unsolicited access, theft, or misuse is essential. Hence, to protect clients' information, financial institutions must use strong data encryption, access control measures, and routine security audits in order to provide topmost data security services.

Customers' must have faith that financial institutions are using their personal information in an ethical and secure manner. Accordingly, in order to ensure customers' trust, as a safeguard against theft and misuse of information, the financial institutions must implement additional security measure and ensure that sensitive and financial data protection is the highest priority.

Secondly, transparency and accountability is key. Customers' right to information with regards to the use of their financial data must always be respected. Financial institutions should make sure that the AI and ML algorithms and models are transparent and accountable. Customers' digital literacy has to be also taken into account, when introducing AI based decisions in order to ensure customers' faith and understanding.

Thirdly, financial organisations must carefully implement the algorithms in a non-biased way. Regularly monitor algorithms for any discriminatory patterns, corrective actions and precautionary measures are a necessity in order to ensure fairness in the technology driven financial ecosystem.

> ## The finance industry is going through significant transformation pressure.

Last but not least, the use of AI and ML must strike to supplement, rather than replace, human expertise. While AI and ML can automate repetitive tasks and make data-driven recommendations, they cannot replace the judgment, experience and expertise of human advisors. Financial institutions have to aim at striking the right balance between automation and human oversight in order to provide the best possible customer experience and protection.

Due to the volume of data available and the accessible processing power, AI and ML approaches are being used a lot in the various fields of the financial industry - asset management, algorithmic trading, credit assessment, blockchain-based finance.

The deployment of AI in finance is expected to increasingly drive competitive advantages for financial services providers, by improving their efficiency through cost reduction and productivity enhancement. Yet, AI applications in finance may create or intensify financial and non-financial risks, and give rise to potential customers worries and distrust.

Hence, from a regulatory perspective, the AI Act and the Data strategy are just one of the steps towards providing a comprehensive framework for supporting the uptake of AI and ML in finance. These legislative frameworks contribute to ensuring that AI and ML systems used in the financial sector are transparent, explainable, and subject to human oversight.

EU legislation strives to ensure that the development and deployment of AI is in secure, ethical, customers' and business friendly manner. At the same time, it seeks to promote innovation and growth in the sector by providing a clear regulatory framework for the development and use of disruptive technologies.

Likewise, the new proposal for the Data Act will unlock even more data that will encourage a bigger competition on the data market and will open more opportunities not only for the already established financial institutions, but also for smaller players and newcomers on the market.

In conclusion, AI and ML have the potential to revolutionise the financial services industry. However, these technologies must always be used ethically and effectively. Data privacy and security, transparency, fairness and a balance between automation and human expertise are all crucial in order AI and ML in finance to succeed and to enjoy customer's trust.

NIKHIL RATHI

Chief Executive Officer -
Financial Conduct Authority (FCA)

How AI and ML are shaping UK financial services

The use of Artificial Intelligence and Machine Learning within the UK financial services sector has grown rapidly in recent years. A recent FCA survey conducted jointly with the Bank of England suggests that the trend is expected to more than triple in the next three years.

Of the regulated firms who responded to the survey, 72% of firms reported that they are actively using or developing machine learning applications. Firms also noted that machine learning applications are now more advanced and increasingly embedded in day-to-day operations, with nearly eight out of ten use cases in the later stages of development.

From our research and supervision, the FCA knows that the digitalisation of financial services can bring many potential benefits to consumers. For example, firms using Artificial Intelligence and Machine Learning can offer more tailored products and services to consumers, improve operational efficiency, increase revenue, and drive innovation – to name just some examples.

The FCA is also increasingly using the technology itself. For example, we are currently developing a machine learning application that allows us to analyse over 100,000 new web domains daily to identify potential scam sites. We are also leveraging Natural Language Processing (NLP) to support our supervision work. And we are investing in Artificial Intelligence tools in our digital intelligence environment.

However, we must not underestimate the challenges these technologies can create. Previous work by the supervisory authorities has shown that the drivers of Artificial Intelligence risk in financial services can occur at different levels within Artificial Intelligence systems, starting with the risks associated with the use of data to train, test, and run Artificial Intelligence models; which can feed into risks arising from the design and use of Artificial Intelligence models themselves. These can, in turn, lead to challenges for the governance structures necessary to manage those risks.

As a result of these, the FCA will continue to monitor the state of Artificial Intelligence and Machine Learning deployment and ensure we understand the different use cases, maturity of applications, benefits, and risks.

We recently published a Discussion Paper with the Bank of England that sets out these issues in more detail. Responses to the Discussion Paper also allow us to gain a better understanding of how the technology is impacting markets and what this may mean for regulation going forwards.

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We are also using the FCA Digital Sandbox to enable new technology propositions to be tested. This allows participants to access a suite of tools to collaborate and develop proof of concepts, as well as access high-quality synthetic data. The FCA Digital Sandbox is likely to become more important in testing and evaluating Artificial Intelligence propositions.

We are also using the FCA Digital Sandbox for our work programme on synthetic data. This is an increasingly important area of research for the FCA. Our Synthetic Data Feedback Statement highlighted industry perspectives and the significant challenges of accessing and sharing data – particularly for smaller firms, however there is a real potential for synthetic data to help combat fraud and money laundering. We will be launching a Synthetic Data Expert Group to explore these issues in more detail with stakeholders across industry and academia.

We are also exploring the impact of other emerging technologies such as quantum computing and quantum communications. Through joint work with the UK Digital Regulation Cooperation Forum (DRCF), we are collaborating on identifying and understanding how quantum technologies could impact digital markets and consumers.

Technology is driving rapid and far-reaching change in financial markets, raising issues from a supervisory, regulatory, ethical and competition point of view. But the frameworks and tools are starting to emerge to think through and address, where needed, the key regulatory issues.

Through collaborative exploration we believe we can develop shared understandings of what matters and how best to achieve the right outcomes for markets and consumers.

GEORGINA BULKELEY

Director for EMEA Financial
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Google Cloud

AI can help to build the future of financial services

There are many applications for artificial intelligence (AI) and machine learning (ML) in financial services. Use of these tools within the industry, both in Europe and across the globe, is likely to increase in the near term. According to the International Data Corporation (IDC), global spending on AI systems was $85.3 billion in 2021 and is forecasted to increase to more than $204 billion in 2025, with a compound annual growth rate (CAGR) of 24.5% over the period.

AI/ML is fundamental to the work Google Cloud does in financial services: ranging from contact centre automation, to document parsing, to services that help customers uncover market trends, perform predictions, and identify transaction anomalies to detect fraud and mitigate risk. This March, Google Cloud announced the next generation of AI for enterprises, developers, and Workspace. Generative AI is an emerging and rapidly evolving technology with complex challenges.

That's why we have invited select developers, including financial services customers, to test these new products and experiences. Our AI Principles and product reviews guide this work and serve as an ongoing commitment to our customers worldwide who rely on our products to build and grow their businesses safely with AI.

As we have said for many years, AI is too important not to regulate. And, it's too important not to regulate well. Policymakers have an important role to play in maximising AI's benefits, and managing its risks. We welcome regulators' efforts around the world to develop proportional, risk-based policies that promote reliable, robust and trustworthy AI applications, while still enabling innovation and the promise of AI for societal benefit. In Europe, the EU AI Act will become the most important regulation to further guide adoption of this technology across different sectors including in finance.

It is critically important that regulation remains focused on the outcomes and specific high risk use cases. Purpose-agnostic technologies like general purpose AI should not be classed as high-risk en-masse, but evaluated instead based on the risk of the applications in which they are embedded. In finance, for instance, these applications may be used to digitise invoices or help a customer quickly access commonly asked questions. Additions to the list of high risk AI applications should not be overly broad in scope, and reflect only genuinely high risk usage to ensure focus on riskiest applications while leaving room for innovation in low-risk applications and general-purpose AI technologies.

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A risk-based framework should focus not on the existence or non-existence of AI in a given tool or application, but rather on how such tools and applications are used by financial services firms—their function—and what they are expected to do – their output. This would allow for risk scoring and management techniques that are well-understood and already in wide use across the financial services industry. A technology-neutral and definition-agnostic regulatory approach also would promote risk management techniques that are themselves flexible, adaptable, and better equipped to adapt over time to technological developments.

In thinking about appropriate regulatory approaches to AI, priority should be placed on standards and frameworks that:

(i) promote parity between between AI and non-AI systems;
(ii) balance the benefits of widespread adoption of AI against reasonably expected risks; and, perhaps most importantly,
(iii) leverage existing rules, standards, and guidance to the fullest extent possible. Google Cloud believes that the Supervisory Authorities should not seek to regulate the use of AI in financial services at the sector-level, but seek to clarify the responsibilities that various parties play in the AI lifecycle. Only where existing regulatory tools are demonstrably insufficient (which, we think, will be the rare case) should additional or AI-specific rules and standards be considered.

We believe that a sound regulatory framework should encourage firms to deploy well-established tools for managing the risk of discriminatory effects of AI-enhanced tools similarly to how they are managed in other contexts. This includes:

(i) processes for ensuring routine and robust data validation and testing throughout the technology lifecycle;
(ii) appropriate governance, and escalation protocols to maximise human oversight;
(iii) standards for AI that emphasise transparency, explainability, and reproducibility;
(iv) requirements for standards-based and technologically-appropriate independent audits.

DIANA PAREDES

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Co-founder - Suade Labs

AI and ML: revolutionizing financial regulatory and supervisory activities

Recent events involving SVB and Credit Suisse have made the conversation around AI and ML more relevant than ever, demonstrating that their use can be crucial to efficiently process large amounts of data and perform risk assessment for supervisors. One wonders if through them, information that is difficult or impossible for humans to detect manually could have surfaced in time to avert the crisis the banking system is currently experiencing.

In April 2020, the Financial Stability Board (FSB) published a report where it stated that "the use of AI and ML in financial services is at an inflection point, moving from a period of experimentation towards widespread adoption." Indeed, the use of AI and ML in financial regulatory and supervisory activities is still in its early stages, but it is rapidly gaining momentum – notably since the COVID-19 pandemic - as data becomes increasingly available, algorithms improve, and more regulators and financial institutions recognize the benefits of these technologies. Regulatory sandboxes and innovation hubs are being established to provide a safe space for regulators, financial institutions, and technology firms to collaborate and experiment with new technologies, helping to accelerate the development and adoption of AI and ML, further driving the trend towards their increasing use in regulatory and supervisory activities.

How AI and ML are bringing value to regulatory and supervisory activities

Regulators and financial institutions are leveraging AI and ML to improve reporting, compliance, risk monitoring, AML and CFT checks, stress tests, capital assessments, and more. These technologies bring significant benefits to regulatory and supervisory activities, improving their risk assessments and compliance monitoring accuracy and, ultimately, the safety and stability of the financial system. They are notably very useful in identifying outliers. Thus, their more intensive use could have helped, in recent events, to detect risky lending practices and disproportionate exposure of assets to rising long-term interest rates, allowing regulators to intervene earlier and perhaps prevent a bank collapse. Similarly, the use of AI and ML could have been more effective in identifying and mitigating inadequate risk management practices, which, as we saw in March, lead to reduced client confidence and exposure to highly leveraged positions.

> **Recent events with SVB and Credit Suisse have made the AI/ML conversation more relevant than ever.**

Lastly, the progressive automation that AI and ML enables also lowers costs by reducing the need for manual labour and frees up regulators to focus on more complex tasks that require human judgment and decision-making. However, it is important to balance the benefits of automation with the need for human oversight and expertise. Some regulatory and supervisory activities require human judgment and cannot be fully programmed.

How to optimize AI and ML use for regulatory and supervisory activities

To optimize the use of AI and ML for regulatory and supervisory activities, a number of conditions must be met. One key factor is data standardization, ensuring that data is properly categorized, labelled, and formatted to enable effective analysis using AI and ML algorithms. Hundreds of thousands of data points must be reported in an increasingly complex regulatory reporting system. Without a coherent structure of data in corporate repositories, a lot of time and resources are lost cleaning and interpreting that data instead of using it.

Moreover, to effectively analyse data using AI algorithms, it is important to have appropriate access to data flows. This may require collaboration between regulators, financial institutions, and other stakeholders to ensure that data is shared in a secure and standardized manner. High-quality data is also essential for effective AI analysis. This includes ensuring that data is accurate, complete, and up-to-date, and that there are appropriate controls in place to ensure data integrity.

Additionally, as AI continues to evolve and become more sophisticated, it will be critical to continue monitoring its impact and developing appropriate safeguards to ensure that it is used in a responsible and ethical manner. Effective governance and oversight structures, including developing clear guidelines and protocols for data use, are necessary to ensure that AI models are transparent and explainable.

Finally, policymakers should also consider the potential impact of AI and ML on the workforce and develop strategies to address the replacement of jobs with machines or the lack of staff skills to work alongside these technologies. Indeed, AI and ML become more prevalent in the financial industry, some jobs may become redundant.