

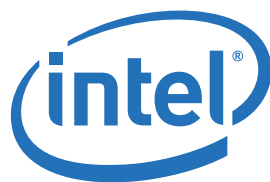
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THE AI REVOLUTION: TIME TO GET READY



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INTRODUCTION

Artificial intelligence (AI) and related technologies are fast making inroads into the financial services industry. Operating in an interconnected, digital world in which money moves instantly, and faced with increasingly stringent regulations, financial institutions are turning to AI to help transform their operations. According to Forbes, organisations invest in AI developments to meet one of three objectives:

- Build systems that think exactly like humans do;
- Get systems to work without figuring out how human reasoning works; or
- Use human reasoning as a model but not necessarily the end goal.

Forbes says the bulk of the AI development falls under the third objective and uses human reasoning as a guide to provide better services or create better products rather than trying to achieve a perfect replica of the human mind.

In November 2017, the Financial Stability Board (FSB) stated that the more efficient processing of information, for example in credit decisions, financial markets, insurance contracts, and customer interaction, that would be realised by deploying AI “may contribute to a more efficient financial system”. The RegTech and SupTech applications of AI and machine learning can help improve regulatory compliance and increase supervisory effectiveness, it added. Overall, the FSB said, AI and machine learning applications show substantial promise if their specific risks are properly managed.

The promise of AI must be weighed against the cost of deployment – such projects are not to be entered into lightly. Calculating the return on investment, or time to value, of AI projects is complex, partly because it is early days for the technology and also partly because the value to an organization of AI will increase as the solution learns more.. “At a recent conference, Bank of America stated that it seeks time to value within one quarter for an AI project,” says Parviz Peiravi, Chief Technology Officer, Financial Services Industry, Intel. “To get value out of AI projects, financial institutions must identify business cases and ensure they have unified data infrastructures on which AI can be deployed. The old adage ‘rubbish in, rubbish out’ still applies today.”



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Parviz Peiravi, Chief Technology Officer, Financial Services Industry, Intel

Digital transformation is not solely about technology; it also requires a change in culture and mindset to allow firms to take the next step and make the most of AI. Senior management within financial institutions need to pledge their support to such transformation and create the environment across an organisation that will foster innovation and enable technologies such as AI to flourish.



¹The Key Definitions Of Artificial Intelligence (AI) That Explain Its Importance, Forbes, 14 February 2018

BUSINESS MODELS AND OPPORTUNITIES

Within financial services, AI is being deployed across many different areas, including algorithmic trading, fraud detection, investment advice and trade settlement. Financial institutions recognise its ability to deliver better business outcomes from very repetitive tasks. By combining AI with machine learning (ML), banks can augment human expertise with the type of insights AI can deliver on vast quantities of data. A subset of AI, ML is a method of designing a sequence of actions to solve a problem (or algorithms), which optimise automatically through experience and with limited or no human intervention.

AI and ML can be deployed to ‘read’ digital communications from customers to their financial institution and automatically route queries to the appropriate staff member. Conversation bots can conduct routine online conversations with clients (without them realising they are interacting with a bot), freeing up bank personnel to deal with more complex queries. According to Forrester Research, AI can assist agents in completing repetitive tasks, or even completely take these tasks over. Instead of replacing humans entirely, AI will enhance agents’ skills and allow them to focus their attention beyond routine tasks. Agents instead will handle customer interactions that require deeper insight, and analysis. “These interactions will often take longer to resolve and are opportunities to nurture profitable customer relationships, which are increasingly rare in a digital-first world,” says the company.

Bradesco Bank in Brazil has implemented a virtual agent, Bradesco Inteligência Artificial, to assist employees and customers in answering their questions about bank products. Since the implementation, Bradesco has recorded customer satisfaction levels of higher than 85%, with 94% of queries being handled by the virtual agent. At Japan’s Mizuho Bank, Pepper, a humanoid robot capable of recognising principal human emotions, was deployed to branches as an official ‘greeter’.

On the trading floors of financial institutions, machine learning can help traders to get greater value out of data related to clients, holdings, trades and events. All of the queries a client contacts an investment management trader about can be incorporated into AI-based augmentation tools. When the investor next



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calls, the trader has all relevant information to hand and can anticipate the best strategy for that client.

Societe Generale, for example, employs many data scientists to train algorithms that deal with various business cases. The SG Markets platform uses ML techniques to create a recommendation engine. Based on the history of trades with Societe Generale, clients are advised of the most relevant research papers to read. The bank has also used ML to analyse thousands of contracts to detect missing clauses or recommend new clauses in legal documentation for clients. A ChatParser application for fixed interest and equities trading desks captures information from various chat systems as well as email, translating them into requests for quotes. This saves precious seconds for traders and improves response time to clients.

Industry analysts Celent believe that AI and robotic process automation (RPA) tools are finally making significant inroads in post-trade operations, automating many manual processes. In its report, *The Next Generation of Post-Trade Technology, Evolution to Revolution*, Celent identifies several use cases for AI in risk and compliance, surveillance, reconciliation, and order management.

“The development of commercial use cases of AI and RPA for capital markets started three years ago, and there are many front office commercially available use cases now in areas such as know your customer (KYC), anti-money laundering (AML), trade surveillance, and natural language generation of standard investment research reports,” say report authors Joséphine de Chazournes and Arin Ray.

RPA systems have been used initially to automate highly manual and repetitive processes to reduce costs and as an alternative to outsourcing. Celent states that this could lead to some headcount reduction, but the more important objective is to enable current resources to process enormous amounts of data efficiently and accurately.

AI is deployed when the processes are less mundane and automatable with a bot. If the operator needs to think in a human way about a decision and enable the decision and automation process to keep going, then RPA and AI are coupled.



THE REGULATORY IMPERATIVE

Another important area for which AI holds great promise is in the fulfilment of regulatory requirements. Initiatives such as the Markets in Financial Instruments Directive, the European Market Infrastructure Regulation, the revised Payment Services Directive (PSD2) and the General Data Protection Regulation (GDPR), are putting data – and its management and governance – front and centre of the operations of financial institutions. At the same time, strengthened rules around AML, anti-terrorist financing (ATF) and sanctions put considerable pressure on financial institutions to ensure compliance.

However, financial institutions typically collect the data necessary to comply with multiple regulations in an unstructured and siloed manner. They often must pay significant fines for AML, ATF and sanctions violations that have totalled in the hundreds of billions of dollars during the past ten years. Violations can occur due to human error or missed deadlines.

The method of analysing data for regulatory obligations and compliance is becoming outdated. Within AML, for example, legacy big data tools and rules-based models produce large numbers of ‘false positives’ which are costly and time-consuming to deal with. A large global bank, which recently adopted big data tools combined with ML, was able to reduce its incidents of false positives in payment transactions. The ML models were built on training data and tested on the streaming layer to identify the fraudulent transactions. Fraudulent transactions were referred to the bank’s fraud detection team with supporting information that aided decision-making.

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Joséphine de Chazournes and Arin Ray, Celent



The system now scores up to 5000 transactions per second for fraudulent behaviour, enabling faster reaction to any fraudulent activities. There has been an 85% reduction in false positives, which has led to faster underwriting and a reduction of more than \$17 million in underwriting costs.

AI's ability to analyse and process large amounts of data, and to explain the rationale behind recommendations, helps banks to meet compliance obligations, mitigating fines and the countless hours they spend reworking reports for different regulatory initiatives.

In PSD2, financial regulators have asked banks to open access to customer accounts to third parties (only with the permission of the account holder). They have to do this, however, within the strictures of the GDPR in Europe and the laws regarding Personal Identifiable Information (PII) in the US, for example. Regulators want financial institutions to share data, but within tightly controlled scenarios.

“Opening up bank data carries an inherent threat of commoditisation for incumbent banks,” says Deloitte. “This is because it potentially enables third parties to own the primary customer relationship, by allowing accounts from different providers to be accessed via a single interface that isn't necessarily owned by an incumbent. It also potentially heightens competition by enabling more personalised comparisons between accounts held at different providers. However, incumbents are also in a position to enhance customer loyalty and engagement by harnessing this additional data to provide, for example, a more personalised customer experience and develop innovative new propositions.”

The ability to exploit and use customer data in innovative and more individually tailored propositions will be paramount for incumbent banks, says Deloitte. Banks will also need to engender a shift in culture towards a 'fail fast and learn quickly' mentality and an agile way of working that encourages experimentation.

According to Forrester Research, AI will fundamentally transform customer services, as consumers increasingly expect intelligent experiences that are personal and contextual to their immediate situation. In financial services, customers will expect highly relevant information each time they interact with their bank.



“Several factors may prevent the adoption of cloud services unless addressed, including data confidentiality and resiliency. Applications built to run in the cloud must fully protect sensitive data, and companies should be aware that they continue to hold complete responsibility for ownership and protection of their own data, not the cloud vendor.”

Robert Palatnick, Managing Director and Chief Technology Architect, DTCC

AI for customer service will, says Forrester:

- **Deliver Differentiated Customer Experiences.** Close to half of consumers already use intelligent assistants such as Alexa, Siri and Cortana to sustain automated conversations. Intelligent agents for customer service will power single purpose chatbots. AI will make these conversations natural and effective. They will anticipate needs based on discerned context, preferences, and prior queries, and will deliver advice, resolutions, alerts, and offers. And they will become better over time.
- **Make Operations Smarter.** AI will streamline enquiry capture and resolution at contact centres. AI will extract useful information from voice and digital conversations, images as well as machine-to-machine communications to quickly identify trends in issues, and customer sentiment that may affect customer retention and loyalty.
- **Uncover new revenue streams and reinvent business models.** AI can uncover patterns in large data sets that may reveal new insights that companies can use to create entirely new services for customers that can be monetised. Machine-learning algorithms used for business and customer intelligence find answers to questions that humans didn't even know to ask.

² How to flourish in an uncertain future Open banking and PSD2, Deloitte, 2017



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TAKING THE FIRST STEP IN THE AI REVOLUTION: BUILDING A DATA-DRIVEN BUSINESS

Getting the most out of AI and complying with regulatory obligations have a common element: to do both, financial institutions must revisit their data infrastructures, creating an enterprise architecture that allows interoperability and information sharing between semi-autonomous, decentralised lines of business. The rigid models of most data analytics solutions don't factor in the natural intelligence of human thought processes. Although these solutions may be able to ingest large volumes of data, their ability to find what really matters in the data is limited.

AI will be central to banks' transformation of their business models and the strategic shift to a more digital organisation. But to get the most out of AI, banks must first address their existing data management challenges. Many forms of data are 'locked' within disparate silos across the multiple lines of business within banks. This makes it difficult for banks to view their data strategically or to take full advantage of what should be, in the digital world, a significant asset.

As analysts Aite Group put it: "Data is more important than ever in the current era of increased regulator- and client-driven transparency, in which every decision could potentially be scrutinised and assessed by internal and external parties. Proving compliance and due diligence requires consistent audit trails for data lineage and data quality. Combine this environment with the ongoing push for financial institutions to innovate and further automate processes toward a potential... future in which cognitive technologies and artificial intelligence take over, and you have a compelling reason to focus on data management and data governance."

To replace manual processes with innovative fintech such as AI, financial institutions must recognise that any progress in this direction will be predicated on data and process standardisation. It is standardisation that must happen within an industry "that traditionally thrives on complexity and customisation", says Aite. "Bad data is bad news for an industry seeking to introduce digital labour and machine learning."



Regulations such as GDPR and PSD2 highlight the impact of existing data structures, where data is not unified. There are two pitfalls to this: it is difficult to analyse data for the purposes of regulatory compliance, and also difficult for banks to determine what new services they should create for particular clients in order to remain competitive.

A unified data and analytics platform will enable banks to effectively govern and share data with third parties. “It is not only regulators that are pushing this agenda; digital transformation requires every aspect of a bank to be focused on data. This is a necessity; it is not a ‘nice to have,’” says Peiravi.

However, it is not easy to achieve.

In addition to the technical issues there are political considerations. Transforming data structures to create data sharing platforms involves removing silos, which are often viewed as personal fiefdoms of different lines of business owners. Wrestling control over the data within these silos will not be without problems.

Complex data analytics is quickly becoming a source of enormous competitive advantage for modern enterprises such as financial institutions. To rapidly move and stay ahead of competitors, businesses must better unify, understand, learn from, and act upon information — at big data scale. To do so, competitive organisations will move beyond traditional, rigid databases and latency batch processing, and towards new technologies that automatically identify and count relationships in data.

“The notion of a big data revolution and the ability to exploit it for business value is often challenging. However, this revolution, contrary to popular belief, is not about data volume; it is about ensuring that data is accurate, securely captured and stored and is accessible across an organisation,” says Peiravi.

“An AI solution will only be as strong as the data that underpins it.”

³ Data Management Technology Trends: Law and Reorder, Aite Group, January 2017



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A CHECKLIST FOR TRANSFORMING DATA STRUCTURES

How should financial institutions go about transforming their data structures to take advantage of AI and other cognitive technologies? There are a number of key areas to address:

Remove silos: Financial institutions must deal with the legacy data management structures that are based on silos. Some large banks can have many thousands of separate databases. Just collecting data from disparate silos and preparing it for AI processes can represent 80% of the time spent on an entire AI project.

Create a data and analytics platform to deal with risk governance and security. Regulators are mandating banks to create federated, data and analytics platforms that enable them to effectively govern data and share it safely with third parties. However, banks have been forced to figure this out for themselves as part of their digital transformation strategies. Banks must remove the political and security barriers to data sharing.

Operationalize advanced analytics for enterprise-wide usage: The creation of an analytic data platform that can deal with a continuous flow of data will be paramount. There are solutions in the market that can automatically cleanse and prepare data prior to analysis. However, to do this effectively a unified data and analytics platform must first be in place. The complexity within financial services is increasing. Data scientists will be required to develop, test and run models on hundreds of algos and also maintain them. This will be within a pipeline of multiple AI projects running at the same time. Algos must be updated, patched and redesigned. These tasks must be operationalised and run in the same way as IT infrastructure.



CONCLUSION

The financial services industry is transforming into a dynamic, digital landscape in which new, more agile competitors are focusing on customer experience. To remain competitive, financial institutions must be able to harness the power of innovations such as AI.

In this dynamic landscape, AI can deliver actionable insights realised in hours or days rather than weeks or months. It can also analyse structured and unstructured data to provide a 360-degree view at the individual entity level, to make sense of the patterns found across boundaries wherever the data is stored. This derives knowledge that is hard to gain with vendor and database proliferation of point solutions. AI can also augment existing resources within banks, enabling staff to focus on higher value activities.

Finally, AI can help banks to address their increasing regulatory burdens, collecting the vast amount of data required by regulators and analysing it correctly in order to mitigate fines and reduce the sheer scale of work required.

But to do this, financial institutions must ensure that they transform their data structures so that a continuous flow of high-quality data can feed into the AI tools that will help them to participate fully in the digital revolution.



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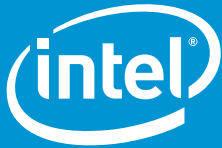
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