



# AI DISRUPTION: THE CHANGING FACE OF FINANCE

Artesian Solutions

# EXECUTIVE SUMMARY

Technology companies such as Apple, Amazon and Google are leading the way with the deployment of Artificial Intelligence (AI), with Siri, Alexa and Nest examples of how AI is becoming mainstream and adopted by consumers keen to embrace and benefit from rapid disruptive enhancements.

But whilst big tech companies might be at the cutting edge of AI, banks and financial institutions are starting to realise the positive impact that AI can make on their business processes.

Chat-bots, product recommendations, and anti-money laundering detection are some of the recent innovations introduced by banks in the UK and across the world.

From the beginnings of AI in the world of chess, the technology has moved away from board games into the board room. Banks are working closely with technology and fintech companies and investing huge sums to develop and launch AI solutions across a wide range of disciplines to become more efficient, improve compliance, enhance customer engagement, reduce costs and enable employees to be more productive.

In this report we explore the evolution and current state of AI adoption in banking and financial services, as well as future developments and the benefits that are starting to flow for the early adopters.

# INTRODUCTION: THE RISE OF MACHINES

Let's first set the scene - What is Artificial Intelligence and how has it evolved?

Essentially AI is the development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. AI technologies and applications include natural language processing (NLP), robotic process automation (RPA), enhanced data analytics, voice/image recognition, complex algorithms and machine learning.

The term 'artificial intelligence' was first used during a summer conference in 1956 at Dartmouth University, organised by young computer scientist, John McCarthy.

Since then it has featured in many films notably 2001: A Space Odyssey, with its intelligent computer named HAL 9000, and the Terminator films with a plot centered on an evil cyborg robot assassin created by an artificial intelligence defence network, known as Skynet.

Fast forward to the end of century and IBM machine Deep Blue took on and beat world chess champion Garry Kasparov, evaluating

up to 200 million positions a second in an event hailed as the moment that AI came of age.

Pace of AI development accelerated as we hit the 21st Century. In 2002 I Robot, created the first commercially successful robot for the home – an autonomous vacuum cleaner called Roomba, ushering in a new era of autonomous robots, focused on specific tasks.

Then in 2008, a small feature appeared on the new Apple iPhone – a Google app with speech recognition. It seemed simple but this heralded a major breakthrough. Despite speech recognition being one of AI's key goals, decades of investment had never lifted it above 80% accuracy. Google pioneered a new approach: thousands of powerful computers, running parallel neural networks, learning to spot patterns in the vast volumes of data streaming in from Google's many users. At first it was still fairly inaccurate but, after years of learning and improvements, Google now claims it is 92% accurate.

In 2011 IBM's Watson took on the human brain on US quiz show Jeopardy. This was a far greater challenge for the machine than chess. Watson had to answer riddles and complex questions. Its makers used a myriad of AI techniques, including neural networks, and trained the machine for more than three years to recognise patterns in questions and answers. Watson easily beat its opposition, the victory went viral and was hailed as a triumph for AI.

Then in 2016 Google's AlphaGo defeated Korean grandmaster Lee Sedol, finishing the best-of-five series with four wins and one loss. This is the first time a machine has topped the very best at Go—a 2,500-year-old game that's exponentially more complex than chess and requires, at least among humans, an added degree of intuition.



# ARTIFICIAL INTELLIGENCE IN BANKING

## & FINANCIAL SERVICES – A BRAVE

### NEW WORLD

Thirty years ago the banking market was dominated by the big four - Barclays, Lloyds, NatWest and Midland. They all delivered a standard set of products and services, and customer service was centred around a wide branch infrastructure, with strong face-to-face relationships between the bank manager and local customers. Fast forward 30 years and things couldn't be more different.

The global financial crisis dealt the banking sector a massive blow. Trust hit an all-time low and almost a decade on and it appears the status quo hasn't significantly changed. According to a 2017 survey by customer experience expert Webhelp only 11% of people have more trust in their bank now than 12 months ago, and 13% of people trust their bank less.<sup>1</sup> Likewise according to the Edelman Trust Barometer 2017, Financial Services is the least trusted industry sector with 73% of respondents concerned or fearful about the pace of innovation in the sector, needing banks to communicate better, be more transparent and solve real problems with technology.<sup>2</sup>

Customers' experiences and expectations changed. The number one trend in the 2017 Retail Banking Trends and Predictions Report was a renewed focus on customer experience.<sup>3</sup> Customer centricity is the new frontier, but banks are not just competing with other banks and financial service providers. They're also competing with the likes of Amazon, who have set the user experience bar when it comes to tailored marketing, hyper personalisation of engagement, and offers/services directly in line with customer preferences and sentiments

Pressure to perform and competition is fierce in the market. Fintech start-ups and challenger banks have redefined the financial services landscape. Harnessing the power of data and insight, they've been syphoning off attractive higher margin business, by being more in tune with customer needs than their established competitors. The incumbent players have been left playing catch-up, hindered by legacy systems, and slow-moving governance and decision making structures.

Whilst banking and financial service firms generate vast quantities of data, they currently lack the tools and expertise to properly aggregate, analyse and make the most of it. Even if they do then the value of data disintegrates quickly McKinsey Global predicts that in coming years there will be an acute shortage of analysts with the skills necessary to analyse data and insight in banking, piling the pressure on even more

According to a report by Ernst & Young (The Relevance Challenge) in 2016 the relevance of banks is waning.<sup>4</sup> Thanks to incumbent legacy technology, and perhaps also legacy thinking, banks and financial institutions have yet to fully combine financial savvy with digital savvy. This has resulted in an insufficiently shallow understanding of customer preferences and behaviours, and therefore an inability to provide customers with the relevant, resonant and timely services and experiences they seek.

A fundamental challenge for banks and financial service providers is that they've long been organised by product and/or channel, resulting in data that is often stored across discrete unconnected systems serving each part of its departmental structure.

Without eliminating these data silos and adopting an enterprise-wide capability it is difficult to obtain a single view of the customer or facilitate data sharing between key parts of the business, unless with the help of manual intervention.

The Perfect Storm! With all these challenges colliding it's easy to see why adoption of Artificial Intelligence is increasingly seen as an important transformational strategy for Banking and Financial Service organisations. The use of AI in banking can be traced back to 1987 when Security Pacific National Bank in the USA set-up a Fraud Prevention Task force to counter the unauthorised use of debit cards.

AI can be applied to both back office and front office tasks and processes. High volume and repetitive processes in back office functions are ideal for AI with strong number crunching ability. AI can add value and improve the quality of front end customer engagement and the customer experience.

According to Accenture, AI will become the main way that banks interact with customers within the next three years.<sup>5</sup>



# EXAMPLES OF CURRENT ARTIFICIAL INTELLIGENCE USAGE IN BANKING

## I. PERSONALISED RECOMMENDATIONS

AI allows banks to unlock value from data, leading to increased revenue and more accurate and appropriate recommendations. Using real time transactional analysis banks can gain a better and deeper view of the customer in order to personalise and recommend value added products.

*“Banks are starting to realise what big data is and get a grip on it.”* According to Edwin van der Ouderaa Accenture’s managing director FS EALA Accenture Analytics. *“It is not just an incremental change to classic analytics, but is actually fundamentally changing the business model of banks.”*

For van der Ouderaa, the future belongs to banks that reach out to their customers, giving them the level of personalised service they have come to expect from service providers in other industries. Recommendation engines have been very successful and a key component in revenue growth accomplished by major banks in recent times. With Big Data and faster computations, machines coupled with accurate artificial intelligence algorithms are set to play a major role in how recommendations are made in the banking sector.

## II. VIRTUAL ASSISTANTS

The giants of the tech world - Apple, Amazon, Google and Microsoft - have developed voice activated virtual assistants that can help with simple tasks and respond to questions.

Siri, Alexa, Google Assistant and Cortana operate as intelligent assistants able to act on voice controls to carry out tasks, answer questions and provide general assistance.

Currently these applications are aimed at tech savvy consumers and the deployment in a business environment is somewhat limited.

However it is expected that virtual assistants will soon be introduced into banks as the technology develops. As well as assisting customers it is expected that these AI powered virtual assistants will be able to identify sales opportunities and provide timely prompts and insights to front line banking relationship managers.

### III. FRAUD PREVENTION

Fraud detection is one of the fields which has received massive boost in providing accurate and superior results with the intervention of Artificial Intelligence. It's one of the key areas in banking sector where AI systems have excelled the most.

Douglas Flint, chairman of HSBC said at the inaugural International Fintech Conference in April: *“Using AI and machine learning to police the financial system is creating opportunities to do things better, to protect customers and ourselves.”*

### IV. ANTI-MONEY LAUNDERING DETECTION

Most of the major banks across the globe are shifting from rule based software systems to AI based systems which are more robust and intelligent to the anti-money laundering patterns.

The CIO at HSBC Darryl West said the bank is using machine learning to run *“analytics over this huge dataset with great compute capability to identify patterns in the data to bring out what looks like nefarious activity within our customer base. The patterns that we identify are then escalated to the agencies and we work with them to track down the bad guys.”*

### V. CHAT-BOTS

Chat-bots are AI based automated chat systems which simulate human conversations without any human intervention. They work by identifying the context and emotions in the text chat and responding to them with the most appropriate and human-like reply. With time, these chat bots collect massive amount of data for the behaviour and habits of the user and learns the behaviour of user which helps to adapt to the needs and moods of the end user.

US Fortune 500 bank Capital One's latest AI-driven initiative is the chat-bot Eno, which markedly shifts the medium from voice to text, Ken Dodlin VP of Digital Product Management explained, *“Texting is the most widely used feature on the smartphone. Ninety-seven percent of smartphone owners text. So we thought that would be a good place for us to spend some time. And we launched the first natural language SMS chat-bot from a U.S. bank.”*

In the UK HSBC have introduced Ask Olivia – if you have a specific query about credit cards or current accounts, just ask Olivia. Simply type in your question and the friendly virtual assistant will be happy to help.





## VI. ROBO-ADVICE

Robo-Advice is the term for online automated guidance and execution of savings and investment advice. Robo-Advice replaces expensive face-to-face advice for lower value and less complex transactions. Reduced costs, lower fees, automated applications processing and access across multiple devices are amongst the key benefits of Robo-advice.

In April 2017 the FT reported that HSBC is planning to offer investment advice for UK customers with small savings pots. HSBC will use robo-advice with a personalised service aimed at providing low cost investment help online for customers with savings of less than £15,000. Taylan Turan, head of HSBC UK's wealth management business, said the online site was aimed at providing fast and low-cost access to investment advice that would be specifically tailored to individual requirements.



# IMPACT ON BANKING ROLES AND SERVICE DELIVERY

Currently the majority of AI systems are focussed on a number of back office tasks, and there has been little or no impact on traditional front line banking roles. This is expected to change in the mid-term as AI builds momentum, however the effect on banking roles will be evolutionary rather than revolutionary. Indeed it could be that a number of new and emerging roles will develop which could off-set any potential job losses in the back-office.

## CAN BANKING REMAIN PERSONAL?

Of course, if you listen to the doomsayers, Artificial Intelligence will create such mass disruption that man will be replaced by bot, and human to human interaction will diminish (something which certainly won't enhance trust in banking and financial markets in the current climate).

But far from taking away that all-important 'personal touch' as banking and financial services become more automated, AI will actually serve to enhance personalisation.

With AI looking after the more mundane and repetitive tasks, Relationship Managers and other front-line staff, will have more time to

develop deeper relationships potential providing greater satisfaction for both the banker and customer.

Using AI techniques, it will be possible to bring together a number of virtual entities (those things that only exist within machines) and layer them onto real-world activities (such as a meeting, phone-call, live chat or briefing) in order to augment customer-facing activities with just the right mix of fact and opinion to make any financial services professional look awesome.

Augment that call by throwing in a useful or insightful contextual anecdote at the vital moment; capture and hold the attention of the room by having a constant supply of precise and up-to-the-minute insight about everyone sitting around the table - their sentiments, immediate needs, and future expectations.

Advances in the performance and accuracy of AI technologies present many new opportunities to augment real world activities with virtual sophistication. The right decision, the right action, the right delivery, to the right people at exactly the right time – the foundation of Customer Experience.

# KEY BENEFITS

With a strategic and intelligent implementation programme banks will soon start the reap significant benefits from any investment in Artificial Intelligence. Here are some of the key benefits that could be achieved:

## IMPROVED CUSTOMER EXPERIENCE

AI will allow bank sales people to provide a more personalised customer experience. By providing a detailed and intelligent single view of the customer, banks will be able to deliver a more tailored and bespoke service to clients. By using AI bank customers will no longer be offered solutions that are not appropriate and improve focus on need.

## LOWER COSTS

Staff costs represent a high proportion of total business costs. In theory AI technology could replace employees with a consequent reduction in payroll costs. Robots and machines do not need salaries or benefits and can work 24/7 without rest or sleep and are more efficient. This is a natural extension of what has been witnessed in banking in the past 20 years or so with automation replacing humans in mainly back office and administration roles.

## INCREASED REVENUE

AI unlocks the ability to deliver the right product to the right customer at the right time and at the right price. Being able to understand and process previously unstructured data will provide banks with deep insights into customer behaviours and propensity to buy specific banking products. This will drive more targeted marketing and sales approaches allowing banks to be pro-active and improve sales conversion rates leading to greater revenue.

## IMPROVED RETENTION RATES

By investing in AI, banks are gaining a deeper understanding of customer behaviours and banking requirements which in turn should lead to improvement in customer satisfaction.

This improved satisfaction should build customer loyalty and assist in retaining customers.

## PRODUCTIVITY GAINS

According to IBM, every day we create 2.5 quintillion bytes of data — so much that 90% of the data in the world today has been created in the last two years alone. To track and analyse such vast amounts of data requires far more compute power than any human brain is capable of. Even if organisations have the manpower and resources to research and track the sheer volume of data held in a myriad of places, there are major problems to overcome.

Much of the data may be irrelevant, no one ever has time to read it all, and if you do it will probably be out of date anyway – truly a case of too much data, too little time.

AI works well for routine repetitive processes and makes them more efficient and effective. AI will allow workers to focus on the processes which benefit them and their customers most on a day-to-day basis. With AI taking care of the boring and mundane this should free up time for workers to become more creative and focus on innovative and higher value activities.

Software vendors have taken up the data and business intelligence challenge - analysing, filtering and presenting the actionable insights of greatest value from the almost unfathomable amounts of data created every day. McKinsey Global estimate as much as 47% of commercial tasks can already be automated.<sup>6</sup>



## WHERE NEXT

Artesian has been undertaking a significant Artificial Intelligence R&D programme based on an incredibly rich understanding of the enterprise B2B landscape through the eyes of some of the biggest and most influential banks, financial service institutions and fintech innovators in the world (HSBC, Barclays, American Express and Metrobank to name but a few). We have been working closely with these leaders to understand what their future looks like, including where the biggest gains can be made, how work processes can be automated, and how the very nature of decision making can be reimaged to keep them one step ahead as the enterprise B2B AI race heats up.

As a result we believe there are several key areas that are ripe for AI disruption in the next 5-7 years:

### PRODUCTIVITY

As the sophistication, performance and integration levels of AI technology increase over time it will open up a whole new world of possibilities for automation, by making the machine an active participant in the team.

Sounds like something out of science fiction (man and bot communicating and working in unison), but modern AI algorithms are already smart enough and fast enough to recognise word patterns and extract meaning or

“intent”. Such AI models built into business applications will transform previously manual tasks in the most intuitive and natural ways – ask a question, get an answer; prompt an action, get a response.

When humans find a way of interacting effectively with machines, suddenly everything can get easier. For banking and financial services this means frictionless access to intelligence of greatest value - golden nuggets which will improve understanding of the customer or prospect and their drivers at any given moment, delivered in the most human way possible for swift, empathetic, direct action. In time these AI powered applications may even act as a proxy, communicating with customers directly in human-like ways - answering their questions, delivering content and generating leads.

The result on productivity? Accenture estimate that the impact of AI technologies could see productivity go by up to 40 percent and enable people to make more efficient use of their time.<sup>7</sup>

Likewise Goldsmiths, University of London suggest that by automating and redeploying humans away from repetitive jobs to tasks that require creativity and innovation, organisations can increase productivity three times over.<sup>8</sup>

## IDENTIFICATION OF NEW OPPS

Predictive analytics has the potential to radically change lead generation by optimising targeting capabilities, prospect profiling, and modelling market and customer dynamics with ever-increasing precision and sophistication.

A study by the Aberdeen Group has shown that improved lead generation is the primary reason why business are investing in AI. With 61% of respondents citing this as their goal.<sup>9</sup>

As AI, mathematical modelling, and machine learning technologies collide with “big data”, it opens up a whole new realm of possibilities in terms of predicting where the customer journey will go next - the actions to be taken that can influence decision making and disrupt the market now, next week, and in the months to come.

When we know exactly what to do next, we can better predict success and avoid failure. As time goes by and the volume of results data improves precision and predictive capacity, these models will get better still, enabling faster and more accurate predictions of customer needs, pain, market challenges and opportunities, before customers themselves even realise what lies ahead.

## INNOVATION AND PRODUCT DEVELOPMENT

Banking and financial services providers are often regarded as “all the same” by customers. It is probably fair to say there is a clear lack of differentiation, with most offering similar products and services. In the financial sector product managers face a difficult task in achieving differentiation thanks in part to the voluminous amounts of data they have to grapple with in order to truly understand usage and feedback on existing products and services, purchasing trends, and market demographics.

Machine learning could turn this on its head, through intuitive:

- Customer mapping to understand the type of customer to be targeted and the problems they need to solve
- Feature planning to understand which are essential to success, and which will only complicate the process and should be deprioritised from the roadmap, or even removed from the product if already live
- Customer journey planning and user analysis to understand the impact of the product, how customers will use and interact with it, how frequently and in what circumstances

The result - a proactive, insight-driven approach, ensuring that product development efforts are focused in the right place and that innovation is boosted by the new potential to reimagine and restructure products and services, in tune with and ahead of customer needs.

## **WHAT THE AI FUTURE LOOKS LIKE FOR LLOYDS BANKING GROUP**

*Where do you see AI having the biggest impact within the banking/financial services sector?*

Supporting customers in financial difficulty is an important consideration for financial services, with rising numbers of people in financial distress. In many cases, customers will benefit from earlier interventions, before problems can take root. Intelligent systems could help us to identify behaviour patterns associated with customers in financial difficulty and make these interventions.

*How will AI impact the revenues of B2B organisations?*

A key opportunity with AI is fraud detection. Significant amounts of money are lost each year due to fraud on cards and accounts. The ability to predict transactions most likely to be fraudulent in advance of any activity taking place would have a financial benefit for both business and their customers.

**David Holton**  
**Corporate Pensions Director**



# IN THE AI RACE THE WINNERS WILL BE THOSE ADOPTING THE RIGHT TECH

Pretty much everywhere you turn at the moment, software vendors are claiming their status as AI-powered. But in reality the evolution of AI is still very much in its infancy. Whilst AI has the potential to fundamentally transform banking and financial service functions within the next decade (if not sooner), there is a potential risk in jumping in too quickly.

Choosing a solution must not just be about the short term gains that can be made, but also about how the solution will evolve in the coming 3-5 years to overcome those inherent challenges and keep teams at the forefront of the intelligent data, insight and engagement strategy. The best AI solutions of the future will not be built on algorithms alone, but on a rich understanding of the financial services landscape and how automation via predictive analytics, Machine Based Learning, Natural Language Processing and AI bots will improve decision making, business processes and customer interaction.

Choose a trusted partner that has:

- **The right pedigree in data mining**
- **A rich heritage in sales intelligence delivery**

- **A background of working with innovative market leaders**

Look at what they have learned from their journey so far and ask questions:

- **How do they see the AI world evolving in the coming months and years?**
- **How do they are embracing the latest technology advances?**
- **How are they are investing in R&D and integrations that will have the biggest impact in the financial world?**

It's up to humans to make the big strategic decisions and set the course for how AI and related technologies will help deliver profitable growth and transformational change in banking and financial service delivery.

**If you want to be part of the AI evolution, you need to invest now, not just financially, but in helping to shape the future by sharing feedback on lessons learned, imparting insight on where the biggest gains can be made, and improving understanding of what will make the biggest difference in your world.**



# ABOUT ARTESIAN

## THE CHANGING LANDSCAPE OF B2B SALES

Artesian is a powerful AI driven service that equips client facing teams with the resources they need to succeed in a modern commercial environment.

Apps that drive action. MI that measures impact. A service that inspires and coaches. Artesian provides the data, real-time insight and context needed to find customers, create meaningful engagements, sell more and create long-lasting business relationships.

## HOW IT WORKS

With the use of AI technology layered on top of company information, data and news, Artesian helps you uncover opportunities, build relationships and accelerate deals.

Artesian continually scans millions of online sources for data on markets, organisations, individuals and topics, and uses sophisticated algorithms to filter and transform that information into commercially valuable insights.

With Artesian, you can track your customers, prospects, competitors and partners; spot and capitalise on business opportunities; and manage risks in your pipeline.

Artesian helps drive customer alignment, credibility, competitiveness and client satisfaction.

**artesian.ai**

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