THE STATE OF AI IN FINANCIAL SERVICES

Quantexa | Finextra

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INTRODUCTION

A small number of multinational top-tier financial institutions are already among the most world's most sophisticated users of enterprise-level artificial intelligence (AI). But while much has been written about the potential for AI to address business problems across the industry, adoption rates and the level of maturity vary widely.

The journey usually begins with data scientists pulling together data sets for experimentation and finding insights and ideas to suggest to innovation teams and business units. From there it often progresses to obvious use cases such as improving money laundering surveillance and financial crime detection.

Eventually, organisations are widening the context of their data through internal consolidation and enrichment with third-party data, and running models and decision engines across multiple functions within the organisation. Depending on the use case, these can deliver streamlined digital channel processing with automated decisions – or rapid presentation of context and insight for human-in-the-loop decisions.

It is the evolution leading to large scale investment, adoption of AI approaches and return on this investment, that this survey sought to illuminate. How many institutions are at each stage of this evolution? What use cases are they focusing on and what challenges are they encountering along the way?
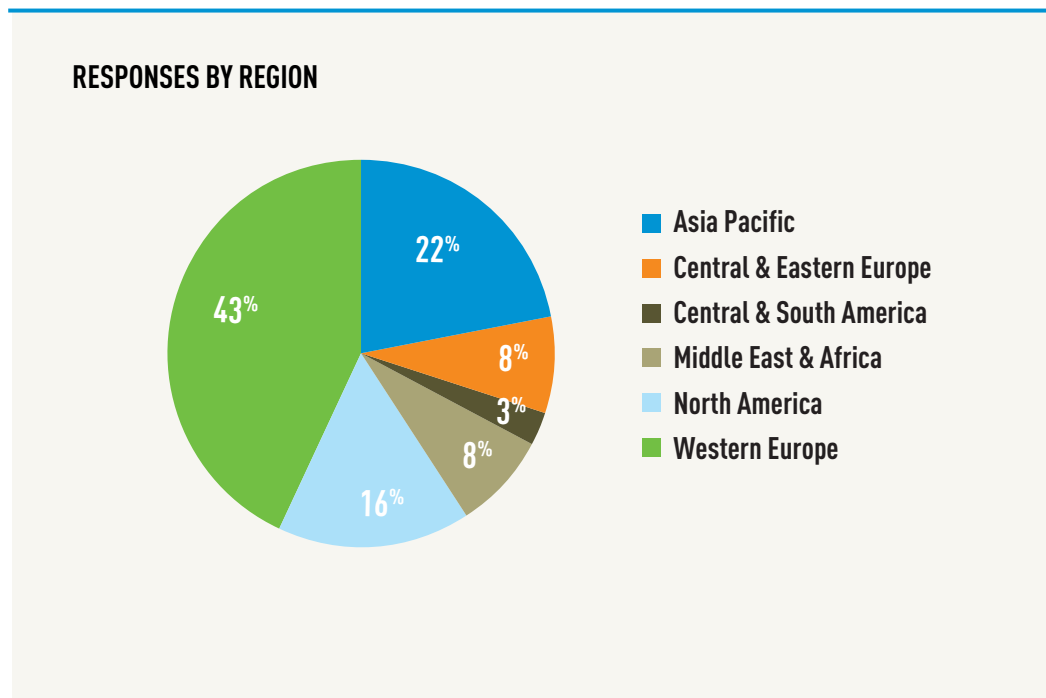
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ABOUT THE SURVEY

In mid-2019 Finextra and Quantexa conducted a questionnaire survey of senior business and technology managers from 31 countries, representing 63 financial institutions, about their current state of AI adoption and their future plans and challenges.

Western Europe represented the largest slice of the respondents' regions, but North America and Asia Pacific were also well represented.

CHART 1

RESPONSES BY REGION

- Asia Pacific — 22%
- Central & Eastern Europe — 8%
- Central & South America — 3%
- Middle East & Africa — 8%
- North America — 16%
- Western Europe — 43%

Respondents spanned areas of responsibility from innovation, IT, data and analytics, to project management, consultants and business group management. Sample job titles included:

- VP Intelligent Automation and Business Process Management
- Sr Business Architect Financial Crimes
- Practice Head Capital Markets
- Chief Investment Officer
- Head of Big Data and Advanced Analytics
- Head of Retail and Business Banking
- Head of Strategy & Innovation
- Head of Cash Management
- Innovation Director
- Head of Fraud Management

Organisations represented in the survey ranged from retail and universal banking groups, transaction banking, brokerage and fund management through to fintechs. Sample organisations include:

- ABSA
- BDO
- Citibank
- Citco Fund Services
- Erste Bank
- HSBC
- Morgans
- Nordea
- SunTrust
- Westpac

CURRENT STATE – WHAT KIND OF AI AND AT WHAT STAGE?

Any questions about how Artificial Intelligence is being adopted in the industry need to be enhanced with a level of precision about exactly what kind of approaches, which sit under this broad umbrella term, are being embraced.

By far the most common type of AI project in production or development is using machine learning and predictive models to support decision-making. In this survey, 31% of respondents said they are using or considering implementation of assisted decision making with an analytical model providing insight from data. This is an obvious evolution of the business intelligence and predictive analytics solutions that have been in use at financial institutions for the past decade or more.

But the difference now is that techniques have moved beyond the simpler models of logistic and linear regression and narrow goals associated with predictive analytics. The machine learning discipline is now more computer science than pure statistics, often incorporates the use of more advanced algorithms, and can be used to address a wider range of problems.

This has led to a field that has been described as decision intelligence – where instead of just presenting data and dashboards to business users, systems are built to make fully automated decisions within seconds or provide significantly enhanced insight for a human to make the decision faster and more efficiently based on a broader set of AI processed input data.

Deep learning or machine learning-based models were the next most common type of AI being implemented by survey respondents (18%), followed closely by organisations that have become confident enough in the accuracy of their models that they are using it in an automated fashion to make system and business decisions without human input (17%).

There are challenges that come with this level of AI implementation, particularly in the areas of transparency, explainability and model bias, and these are covered in section 5 of this survey report.

In a free text field response to this question about types of AI in use, 11% of all respondents indicated variations on the theme of "all of the above" to indicate the wide extent of their current or planned use of AI approaches.

Extrapolating from our survey across a broad range of different types of financial institutions globally, about two thirds have already deployed AI in production use or in pilots; 33% have at least one AI implementation running in production, while 31% have pilots or proofs of concept underway. A further 25% have plans to implement in future.

"By far the most common type of AI project in production or development is using machine learning and predictive models to support decision-making. In this survey, 31% of respondents said they are using or considering implementation of assisted decision making with an analytical model providing insight from data."

CHART 2

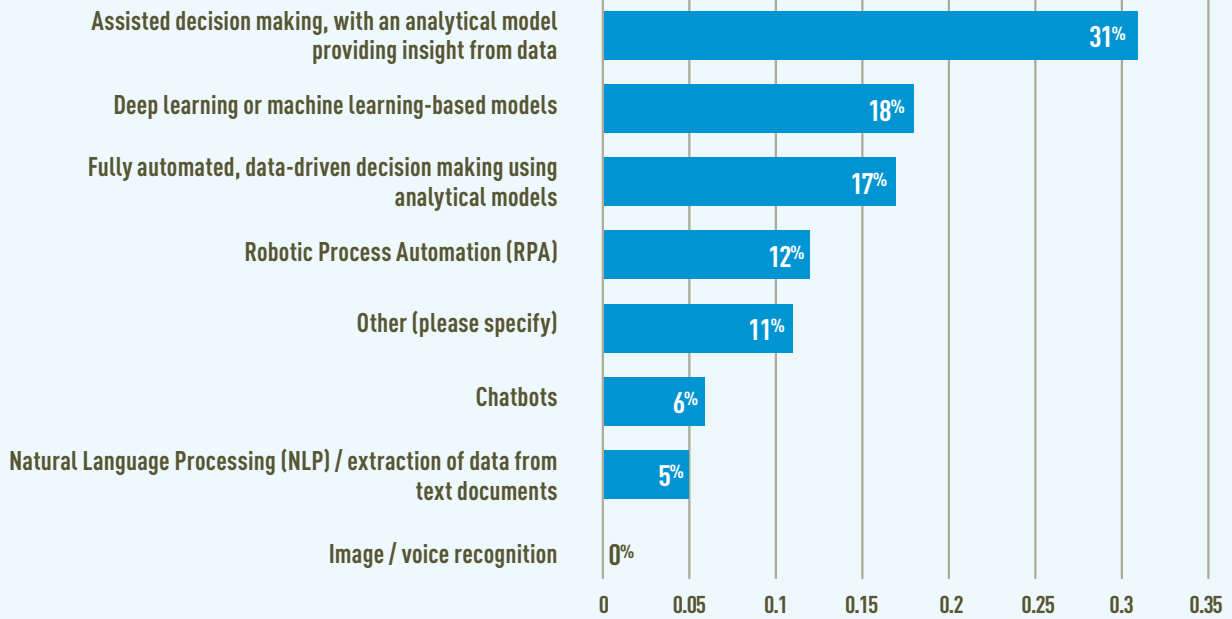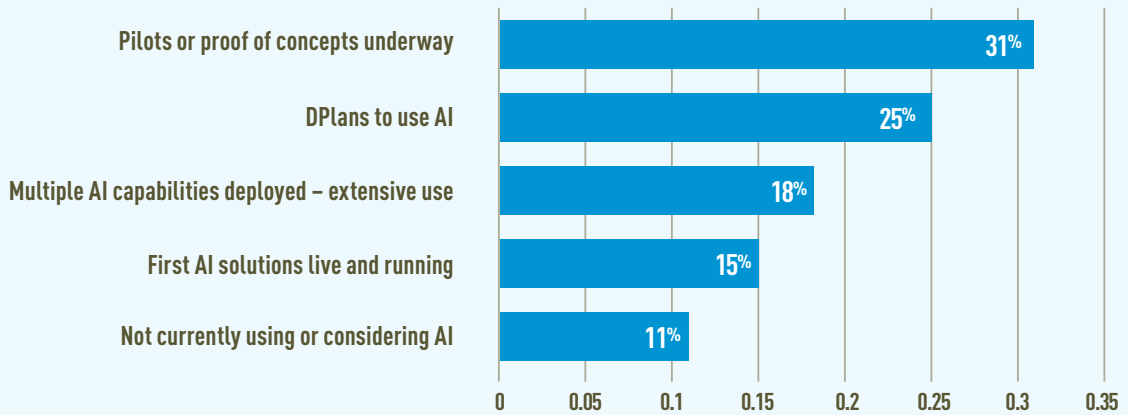## WHAT TYPES OF AI ARE YOU USING OR CONSIDERING USING?

Category	Percentage
Assisted decision making, with an analytical model providing insight from data	31%
Deep learning or machine learning-based models	18%
Fully automated, data-driven decision making using analytical models	17%
Robotic Process Automation (RPA)	12%
Other (please specify)	11%
Chatbots	6%
Natural Language Processing (NLP) / extraction of data from text documents	5%
Image / voice recognition	0%

CHART 3

WHAT IS YOUR DEPARTMENTS CURRENT LEVEL OF ADOPTION OF AI?

Category	Percentage
Pilots or proof of concepts underway	31%
DPlans to use AI	25%
Multiple AI capabilities deployed – extensive use	18%
First AI solutions live and running	15%
Not currently using or considering AI	11%

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CURRENT AND FUTURE USE CASES

Confidence across the industry is high that AI will play an important role in the short and medium term in areas as diverse as operational efficiency, risk management, fraud prevention and customer insights.

Only 10% of respondents said there are no significant plans to use AI in their department or organisation. Fifty-four per cent are already pursuing or planning major adoption or kicking off a programme, while 30% are still in an experimental phase.

As more and more data is being processed in real time from within and outside of financial organisations it is no surprise that they are looking to leverage this to improve their operational efficiency. In fact, operational optimisation and compliance, surveillance and anti-money laundering were the most common use cases identified in this survey.

Compliance and financial crime have proven to be functions with a particularly compelling business case for the adoption of AI techniques. This is largely due to the large staff requirements and high false positive alert rates for non-AI driven approaches, as well as increases in regulatory oversight and penalties. However, these successes have only really come as a result of the aggregation of multiple data sources and providing context around customer behaviour before applying analytical models to reduce the human effort in compliance review tasks. Instead of many staff focused on low level monitoring and appraisal they can instead turn to robotics and artificial intelligence, and focus on up-skilling employees to higher value tasks.

Seventeen per cent of respondents indicated these optimisation and compliance use cases are leading the pack when they consider AI implementation in their business.

Other prominent use cases revolved around the customer; learning more about their behaviours, anticipating their needs and identifying opportunities, while making the onboarding process more streamlined for new products and relationships, and improving service.

Sales and marketing functions tend to be next on the agenda for those organisations that have already achieved some level of maturity in AI deployment for financial crime. To be successful, use cases in customer insight and referral-based sales need to be built on the same key ingredients that market leaders have used to drive success in their financial crime project-full context of data from multiple sources, and a network view of entities and transactions. With this in place, AI models can then be deployed to assist or suggest to a customer what product may make sense for them or to help a relationship manager work out if a prospect is good, receptive and how to find a route to effectively contact them.

The survey's free text field response for use cases also resulted in some more specific use case suggestions including different areas of risk management beyond credit risk, and also compliance with the EU's General Data Protection Regulation and global equivalents.

CHART 4
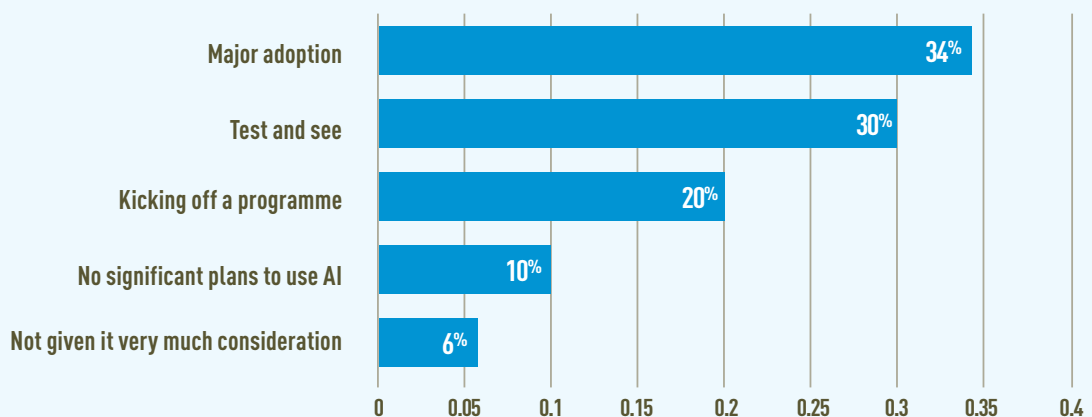
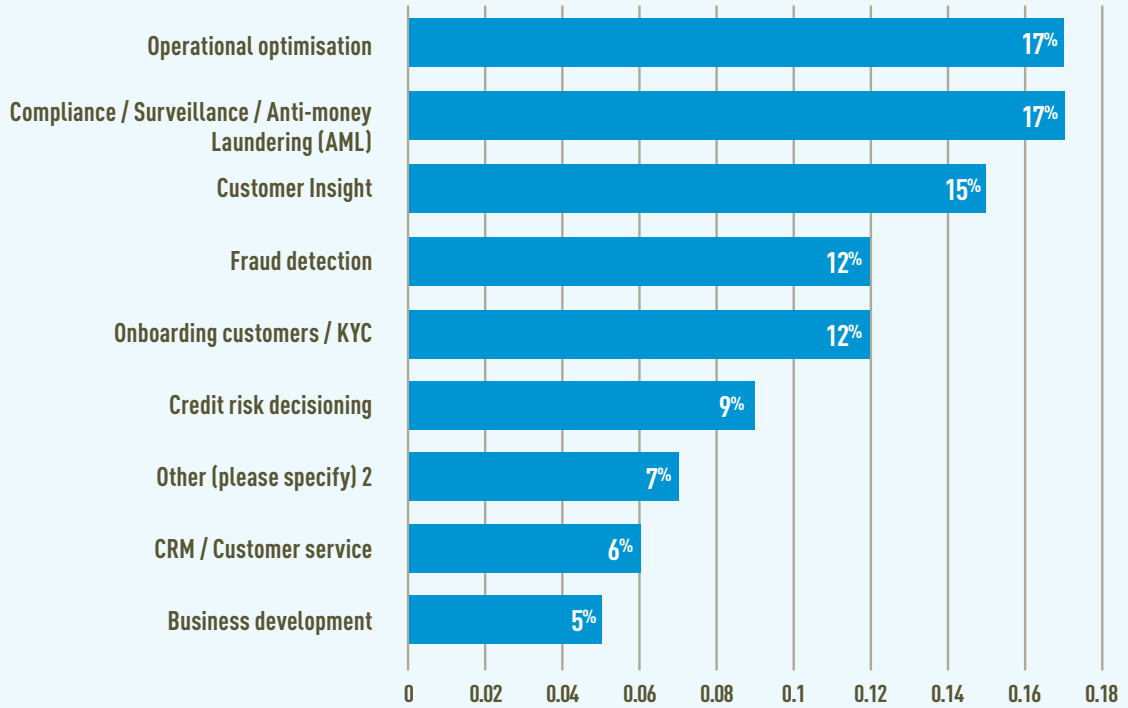## FUTURE / PLANNED LEVEL OF AI ADOPTION (SELECT ONE):

Category	Percentage
Major adoption	34%
Test and see	30%
Kicking off a programme	20%
No significant plans to use AI	10%
Not given it very much consideration	6%

CHART 5

WHAT USE CASES DO YOU HAVE IN MIND?

Use Case	Percentage
Operational optimisation	17%
Compliance / Surveillance / Anti-money Laundering (AML)	17%
Customer Insight	15%
Fraud detection	12%
Onboarding customers / KYC	12%
Credit risk decisioning	9%
Other (please specify) 2	7%
CRM / Customer service	6%
Business development	5%

Axis: 0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18

"Only 10% of respondents said there are no significant plans to use AI in their department or organisation. Fifty-four per cent are already pursuing or planning major adoption or kicking off a programme, while 30% are still in an experimental phase."

DATA READINESS AND OTHER CHALLENGES

For any business problem that organisations hope to use AI to address, the accuracy and lack of bias in any eventual decision, prediction or feature identification should be top of the list of desired outcomes. To this end, having data available that is of an "acceptable quality" is a priority. But only 24% of respondents say they are currently in this state of data readiness.

Data readiness is a fluid concept, and many of the more advanced organisations have realised that if they wait until they have perfect data to embark on their AI journey they will never begin. But other responses to this survey question identify what activities are being pursued to improve data quality and ease of use. From a business perspective, internal aggregation of disparate data sources into a single view of the customer has been achieved by 18% of respondents, while on a more technical level, 17% have implemented a data lake- a centralised repository for storing structured and unstructured data at any scale.

Single view approaches such as these can be enhanced with third-party data and network or graph approaches to fully understand the context and behaviour of their customers. While a smaller number of organisations say they are currently doing this, these are the ones that are likely to be seeing the best results.

Once data is made available in a data lake, it becomes easier to feed into machine learning models and systems, and the support for unstructured data makes it particularly useful for text analysis and mining. Fourteen per cent are using unstructured data in this way, while only 10% of respondents have moved beyond their internal data stores to incorporate external data to enrich their models.

Moving beyond their current state to anticipate their next challenges, data readiness again tops the list. But there are a range of other potential obstacles to seeing AI implementations through to enterprise-level production and delivery of business value. Some of these are technical while others are related to culture and people.

Besides data readiness, making AI operational– taking it from proof of concept to production– is considered the biggest challenge, with 17% of respondents identifying this. Such operationalising challenges can arise from internal politics– for example, whether a proof of concept in one business department can attract the support of group technology and innovation teams, or vice versa. It can also arise from challenges in integrating AI-assisted decision-making into accepted human workflows, and even more so when the outputs of AI models are to be fed automatically into processes.

The organisaton's IT architecture itself can also hinder operationalising IT projects. Proofs of concept and pilots are often based on running models over batch processed internal and third-party data sets. However, in production systems, straight-through decisions from models need to be real-time, as does the presentation of selected data and context for review in human-in-the-loop processes.

It is challenging to implement the data fabric at scale to deliver a single view of internal data, join third party data and link into networks along with a real time engine to execute the decision intelligence. But it is a challenge that is increasingly being met by market leaders.

Skills availability is another issue. While tertiary education institutions and large financial industry players are individually and collaboratively pushing data science and AI education as the key to the fourth industrial revolution, demand for these skills still often far exceeds supply, particularly outside of the world's major financial centres.
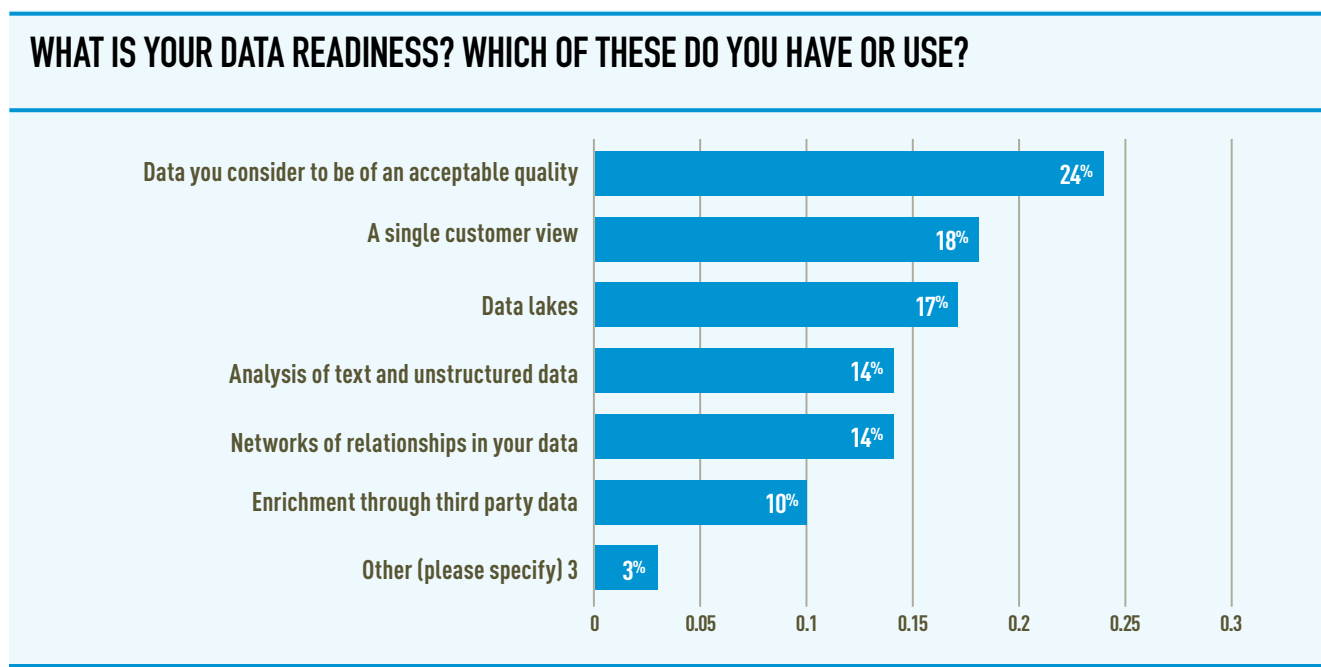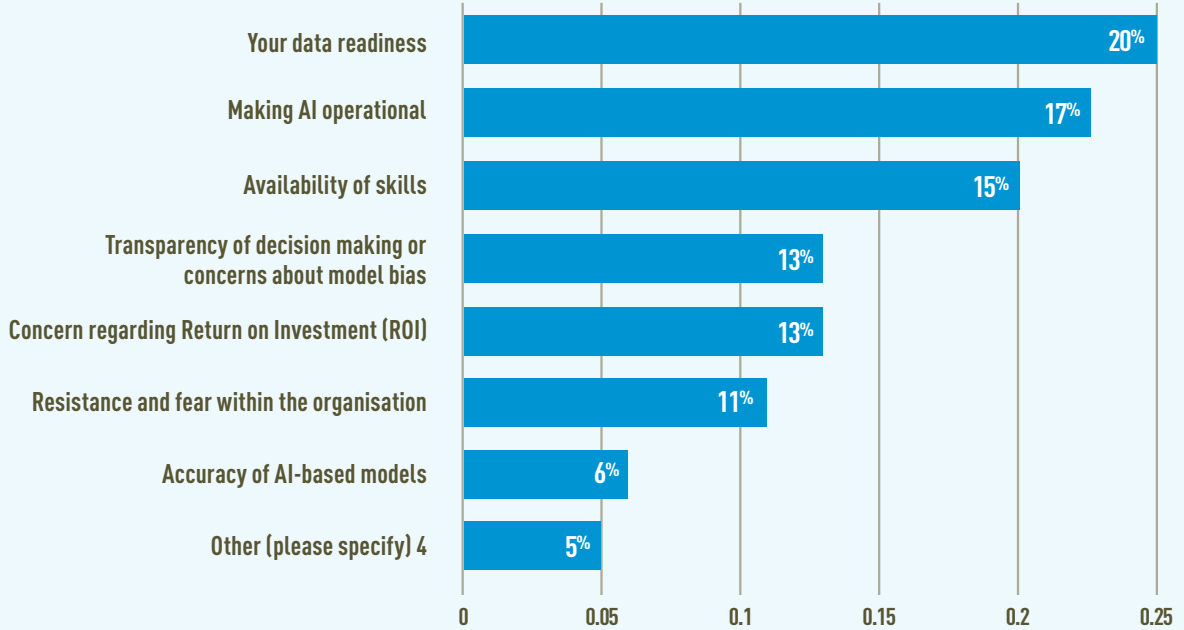
CHART 6

WHAT IS YOUR DATA READINESS? WHICH OF THESE DO YOU HAVE OR USE?

Category	Value
Data you consider to be of an acceptable quality	24%
A single customer view	18%
Data lakes	17%
Analysis of text and unstructured data	14%
Networks of relationships in your data	14%
Enrichment through third party data	10%
Other (please specify) 3	3%

CHART 7

WHAT DO YOU SEE AS THE KEY CHALLENGES FOR AI ADOPTION?

Challenge	Percentage
Your data readiness	20%
Making AI operational	17%
Availability of skills	15%
Transparency of decision making or concerns about model bias	13%
Concern regarding Return on Investment (ROI)	13%
Resistance and fear within the organisation	11%
Accuracy of AI-based models	6%
Other (please specify) 4	5%

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DEPLOYMENT APPROACHES, COST AND ROI

Moving AI beyond experimentation and into enterprise usage and acceptance can require significant investment. In some cases it can be easy to measure the return on this investment post-implementation. Operational efficiency use cases, such as where outcomes have improved or stayed the same with reduced headcount, are obvious examples. But in other use cases– particularly new product delivery, improved risk management or customer service improvement, ROI can be harder to calculate.

This survey found that 26% of respondents who had live deployments of any AI-driven project had seen strong ROI or outstanding results with payback within months. Fifty-four per cent have begun to see some return on their investment, with an anticipated multi-year payback timeframe.

But 20% have gone live with AI projects that have yet to deliver any return on the investment required to bring them to production.

Interestingly, when asked about how they have predominantly managed their AI initiatives to date, 33% said they had built and deployed themselves with solely internal teams. But this group made up more than half of those with projects that failed to deliver any ROI.

The next most common deployment approach has been to create a platform for multiple use cases (20% of respondents) which shows desire to avoid the fragmentation of AI solutions and approaches that can occur when project initiation and approvals arrive from multiple sources within a large financial organisation.

Much smaller numbers are going live purely with end-to-end packaged solutions (10%) or cloud providers (8%).

Looking ahead in the next 12 months to mid-2020, our survey found departmental budgets for AI projects were healthy across a range of sectors and organisation sizes in the financial services industry. Twenty-nine per cent of respondents had departmental allocation of budget for these projects in excess of $1m.
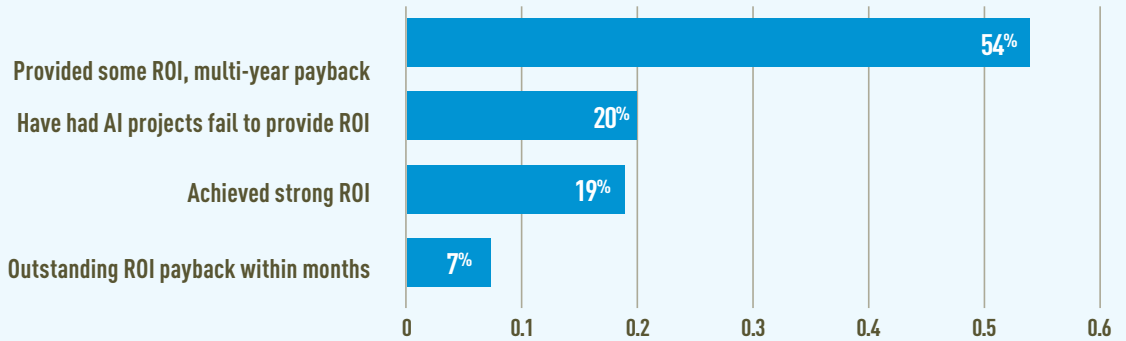
CHART 8

AI IMPACT AND RETURN ON INVESTMENT

Category	Value
Provided some ROI, multi-year payback	54%
Have had AI projects fail to provide ROI	20%
Achieved strong ROI	19%
Outstanding ROI payback within months	7%

CHART 9

DEPLOYMENT APPROACH – WHICH OF THE FOLLOWING APPLY:

Category	Value
Build ourselves & creating our own teams	33%
Creating a platform for multiple use cases	20%
Buy packaged end-to-end solutions	10%
Other (please specify) 5	8%
Deploying in a cloud provider such as Amazon Web Services, Microsoft Azure or Google	8%
Considering real time or on demand capabilities	8%
Use a system integrator	7%
Make use of or plan to use open source technologies	6%

CHART 10

HOW MUCH DO YOU PLAN TO SPEND ON AI PROJECTS WITHIN YOUR DEPARTMENT IN THE NEXT YEAR?
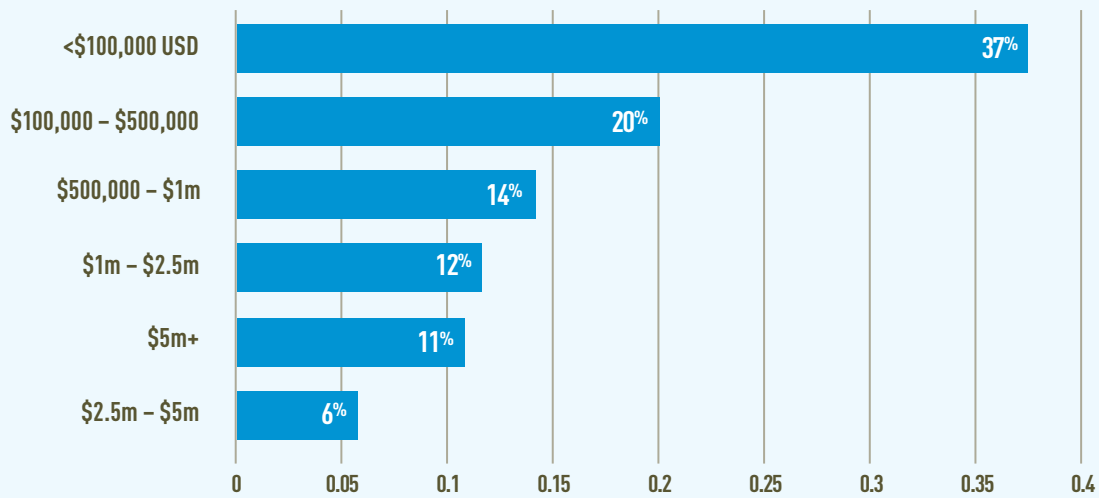
Budget	Percentage
<$100,000 USD	37%
$100,000 – $500,000	20%
$500,000 – $1m	14%
$1m – $2.5m	12%
$5m+	11%
$2.5m – $5m	6%

Axis: 0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4

"Looking ahead in the next 12 months to mid-2020, our survey found departmental budgets for AI projects were healthy across a range of sectors and organisation sizes in the financial services industry. Twenty-nine per cent of respondents had departmental allocation of budget for these projects in excess of $1m."

SUMMARY AND SURVEY RESPONSE

Imam Hoque
Chief product officer, Quantexa

AI is just a tool – a way of making better decisions based on data. But the reality is that those decisions don't become compelling until the organisation is implementing these intelligent decisions at scale.

This survey found that a sizeable proportion of financial institutions have begun to see the benefits of operationalising AI at scale, despite the challenges they have faced in getting there.

The most common implementation of AI-assisted decision making (31%) is still human-in-the-loop. And those organisations seeing the most success here are removing a lot of the data presentation usually associated with business intelligence approaches and only presenting to employees the areas of data and context they need to focus in on, appraise or enhance with more data before a final decision.

Straight-through execution of decisions is being used or considered by 17% of organisations, however, and this is an area where significant ROI can be achieved if the challenges of making AI operational can be overcome.

In order to do this, organisations need to deploy a decision intelligence capability that continuously pumps the data into their data lake, with an architecture that enables it to operate as a real-time decision engine into which they can deploy the models developed by the data scientists. Moreover, for these models to be effective they must have access to the "big picture" of the data, i.e. the full context– a single view of the customer, enriched with third party data and the relationships this customer has with others. Only then can the AI models really start adding value, responding to customer interactions in real time or supporting relationship managers at the point they need support for customer interactions.

Our experience is that the more mature customers that focus on outcomes rather than technology achieve the best ROI cases- typically within a year. It is possible to short cut the skill shortages and tinkering mentality by using a tried and tested starting point.

It may be tempting to build using entirely open source, but those who have delivered maximum ROI cases have started with components that co-exist with open source but accelerate some of the critical aspects such as creating the single view and context of a customer and providing an environment where models can be deployed to operate robustly in real time.

After all, few people today start an IT project by building an operating system, relational data base or ERP if they are available off the shelf at reasonable cost. Such a robust platform will service multiple use cases- accelerating time to ROI as 90% of an AI project is often about preparing the data and context.

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ABOUT

Finextra

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Quantexa

Quantexa is a decision intelligence software and solutions company that empowers organisations to drive better decisions from their data. Using the latest advancements in big data and AI, Quantexa's platform uncovers hidden risk and opportunities within your data, and solves major challenges across financial crime, customer intelligence, credit risk and fraud.

By bringing together billions of data points from any internal, external, static and behavioural source, our platform creates a single entity view across your organisation. We build networks in real time to identify relevant connections, relationships and behaviours in your data.

The Quantexa platform has thousands of users working with billions of transactions and data points. We are a global business with offices in London, New York, Boston, Belgium, Toronto, Singapore, Melbourne and Sydney.

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