AI IN PAYMENTS:
THE LAST MILE IN EFFICIENCY

Pelican
SIMPLY INTELLIGENT

Finextra

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FOREWORD

AI IS ADDING VALUE TODAY

BY PARTH DESAI
FOUNDER AND CEO, PELICAN

There has been much talk about the use of artificial intelligence (AI) within financial services to streamline processes and add value, some of which we are already seeing in the form of robo advisors and big data processors. In the world of payments, AI has the potential to solve many issues for the financial providers and corporates – reducing middle and back office administration, for example.

AI – which uses computing power and knowledge to simulate intelligent human behaviour – is already part of our world, due in large part to the pervasive use of mobile devices, coupled with advances in natural language understanding and facial recognition. Elsewhere, self-driving cars and robots are increasingly applying interpretation and understanding in order to give information context and learn.

While the use of AI in our everyday lives is growing, we all also feel that AI has much further to go – which can make it easy to forget how much benefit can already be derived from these technologies in today's payments environment.

Certainly we are a long way from developing general purpose intelligent machines that operate on the same scale as human beings, because the computational power needed to use all the knowledge for this will be enormous. Therefore, all AI machines currently need to be task-specific, but nonetheless AI can deliver real benefits right now, by offering the ability to solve practical problems in less time and using the available computational power.

And this is where AI offers real potential for the financial services industry – by ensuring specific tasks are automated while still being completed to the same standard as if human employees were undertaking them, albeit more efficiently. The application of AI in the context of payments exception processing becomes clear, then, with AI holding out the prospect of automating the last remaining elements of manual processing, and bringing the cost, efficiency and risk

reduction benefits inherent in eliminating expensive, time-consuming and error-prone human intervention.

In fact, though talk of AI can quickly get into the realms of science fiction, solutions to apply AI to payments processing not only exist today, but are being fully exploited today by some leading firms. AI will deliver more in the future of course, but it is already delivering, and so the question every player in the payments industry should ask is whether they are currently deriving as much value from AI as they could or should be.

Pelican's interest in working with Finextra on the research presented in this white paper has been to help drive understanding of the benefits of AI in payments, while also establishing how these technologies are being exploited today, and trying to surface what the barriers to the full exploitation of AI for payments market participants might be.

If as an industry we can understand our challenges when it comes to taking advantage of AI, it should help us to find strategies to overcome them, to make sure that the exciting potential of AI to help address challenges of product innovation and faster time to market and to drive out the remaining costs and inefficiencies in payments processing is fulfilled. In an environment where cost reduction remains a priority, compliance is a growing challenge, and the competitive landscape is changing, no player can afford to ignore the power of AI to help realise the vision of full automation required to complete the transformation of the payments business in this digital age.

I hope you find the results of the survey interesting and useful, and I invite you to get in touch if you would like to discuss any aspect of AI in payments further.

> **Do not let the IT people drive AI. The business lines are in a much better position to realize value.**
> GLOBAL PAYMENTS EXECUTIVE, UNITED STATES

02
EXECUTIVE SUMMARY

In order to respond to the shifting business, financial and regulatory landscape, financial institutions need to have the highest levels of efficiency across key activities such as payments processing, customer onboarding, product innovation and time to market, as well as sanctions screening, anti-money laundering (AML) and fraud detection.

But what can institutions do if they have implemented the full extent of the automation possible using traditional systems? Are there alternatives to simply throwing more people at the unautomated aspects in the hope of driving further efficiency that way?

This survey finds that although it's early days, artificial intelligence (AI) could play an increasingly important role. There are three capabilities contributing to AI that are most applicable. Natural language processing enables information presented by human beings in free format text to be understood and acted upon by computers. Machine learning enables computers to remember repeated past experiences and to perform past actions automatically in a controlled and supervised manner. Knowledge-based systems use common sense and domain specific information to make automated decisions, simulating intelligent behaviour in a well-defined domain.

The survey carried out by Finextra in association with Pelican shows that most AI implementation in payments so far has been limited to early adopter tier-one financial institutions, and mostly in the area of AML sanctions screening. But the greatest opportunities for addressing operational and business pain points lie in product innovation and time to market, and these areas along with customer retention and reconciliation/repairs are actively being evaluated for new AI deployments.

Key findings of the survey include:

- Improving time to market is a bigger challenge than regulatory compliance for most organisations, and this is the area of the payments business with the highest inefficiency.
- For many respondents there is still significant inefficiency in payments processing, despite this being an area in which significant investment has been made in recent years.
- Routing and investigations are the parts of the payments lifecycle most contributing to this inefficiency. Inhouse development and vendor solutions are being implemented at just over half of organisations to address this. But the areas in which most organisations are currently looking to make new technology investment are product innovation, time to market and customer retention.
- 45% agree or strongly agree that there is strong potential for AI to address remaining inefficiencies in their payments business and operations compared to just 10% who disagreed or strongly disagreed
- 26% of organisations already have inhouse or vendor supplied AI capabilities for sanctions screening/AML/fraud prevention. This is the area which organisations see as likely to gain the most potential benefit from natural language processing and machine learning, followed by customer retention, onboarding and investigations.
- 70% agree or strongly agree that there's a need for more industry awareness of how AI technologies can apply in transaction banking.

> **AI could help in cash flow management of retail customers as well as corporates based on spend/ expense patterns, liabilities and efficient usage of float or surplus funds**
> PAYMENTS CONSULTANT, INDIA

03
ABOUT THE SURVEY

This study was conducted during summer 2016 and sought responses from financial institutions and other organisations involved in the payments ecosystem.

The survey sought to answer the following main questions: where are the opportunities to deploy artificial intelligence (AI) in payments processing, and what progress has been made with the adoption of AI in this space so far?

We received 122 responses from 103 organisations involved in payments in 32 countries. Where multiple responses came from a single large financial group they were frequently from different geographies or business units. 36% of responses were from the UK and 77% from Western Europe, with the remainder spread worldwide. Where responses differed along regional lines this has been noted in the analysis.

Sample job titles from which responses were received included:

• Operations Director, Payments
• Head of Retail and Corporate Operations
• Head of Payments Infrastructure
• Head of Digital Factory
• Director, Payments
• Innovation leader
• Global Transaction Banking Manager
• Head, Global Payments
• Corporate Development Director
• Head: Fintech and Innovation

04
CHALLENGES AND INEFFICIENCIES IN PAYMENTS BUSINESS AND OPERATIONS

Slow time to market causes frustration

Anyone who has spent time working for a bank will not be surprised that legacy system transformation was deemed the biggest challenge faced by respondents in our survey. That frustration is most clearly expressed by the 6% who described it as impossible.

Since 2009 the regulatory burden on banks has increased dramatically, leading one survey respondent to note in a comment to the survey that with compliance projects swallowing the majority of resources and budget, transformative projects including the use of artificial intelligence are hard to prioritise.

The burden of compliance is often lamented across the industry, but in this survey improving time to market was considered an even bigger challenge. It was considered very challenging or impossible by 53% of respondents.

Time to market is an internal pressure for banks and other service providers, which are unable to create and launch new products and services as quickly as they would like. Without addressing this challenge, they remain slow to deal with the threat from more agile competitors, and slow time to market also means a delay in generating revenue, return on investment and profit.

Keeping up with customer demands was considered very challenging or impossible by 42% of respondents outside of Western Europe, but, perhaps reflecting more sophisticated payment product and marketing capabilities in Western Europe, only 22% of respondents from that region considered it a significant issue.

Real-time, 24/7 payments were seen as the least challenging area of change. But again, looking at the geographic split, countries in which market and bank infrastructure has already been upgraded and business models and rules established were even less likely to consider this a challenge. In countries where real-time payment transformation is still in the planning stage, everything from core platform upgrades to business model changes are still on the cards.

Many pockets of inefficiency remain to be addressed

Investment in technology over the past two decades has transformed the payments business. But the gains in efficiency have not been uniform. While automation has removed a lot of paper and manual processes, and improved straight through processing in many areas, much inefficiency remains – particularly away from the core back office activities in areas such as product and service innovation and onboarding.

Backing up the response to question 1, where time to market was identified as one of the biggest challenges facing organisations, it was also identified as the area with the most inefficiency. 73% of respondents described it as somewhat or highly inefficient. Time to market inefficiency was even worse for respondents outside of Western Europe – 80% compared to 69% in Western Europe. North American respondents were the most critical of their capabilities in this area, with 93% saying they were somewhat or highly inefficient in bringing products and services to market.

Even though it was rated as the most efficient part of their payments business, processing was still described as inefficient by a significant number of respondents (37%). This raises the question: with all the investment and technology implemented to solve this problem to date, why can't payments processing be close to 100% efficient?

Question 3 of the survey drilled down further into discrete areas of the processing chain to identify the main contributors to ongoing inefficiency. Routing and investigations were identified as main areas where efficiency needs to be improved, with 65% and 47% of respondents respectively describing these areas as currently inefficient. But even the best performing technology area within payments processing – initiation – saw 33% of respondents describe it as somewhat or highly inefficient.

> **I think customers will have a trust issue with AI dealing with their financial transactions that could prevent the technology/capability from becoming a core part of the banking experience.**
>
> PROPOSITION MANAGER – RETAIL STRATEGY, UNITED KINGDOM

1. HOW CHALLENGING IS IT FOR YOUR ORGANISATION TO RESPOND TO THE FOLLOWING CHANGE DRIVERS IN THE PAYMENTS BUSINESS?

	Not challenging	A little challenging	Somewhat challenging	Very challenging	Impossible
Legacy system transformation	7%	8%	23%	56%	6%
Drive to reduce time to market	5%	7%	35%	51%	2%
Increasing compliance demands	4%	11%	41%	44%	0%
Increased competition from the wealth of new entrants into the market	6%	20%	34%	39%	1%
Increasing customer demands e.g. for ease of use	5%	15%	46%	32%	2%
Real-time payments with 24x7 availability	16%	15%	36%	32%	1%

AI is still in its infancy. For a highly regulated field like banking and payments processing AI has to reliably and repeatedly prove that its decisioning process falls under the regulatory framework and not cause operational decisions that can create legal issues resulting in fines.

DIRECTOR, UNITED STATES

2. WHICH OF THE FOLLOWING BEST DESCRIBES THE CURRENT TECHNOLOGY IN YOUR PAYMENTS BUSINESS?

	Highly inefficient	Some inefficiency	Efficient	Highly efficient
Time to market	24%	49%	24%	3%
Product innovation	15%	46%	35%	4%
On-boarding	11%	53%	29%	7%
Customer retention	6%	33%	50%	11%
Sanctions Screening/AML/Fraud	8%	34%	45%	13%
Payments processing	3%	34%	42%	21%

- Highly inefficient
- Some inefficiency
- Efficient
- Highly efficient

3. WHICH OF THE FOLLOWING BEST DESCRIBES THE CURRENT TECHNOLOGY IN YOUR PAYMENTS PROCESSING OPERATIONS?
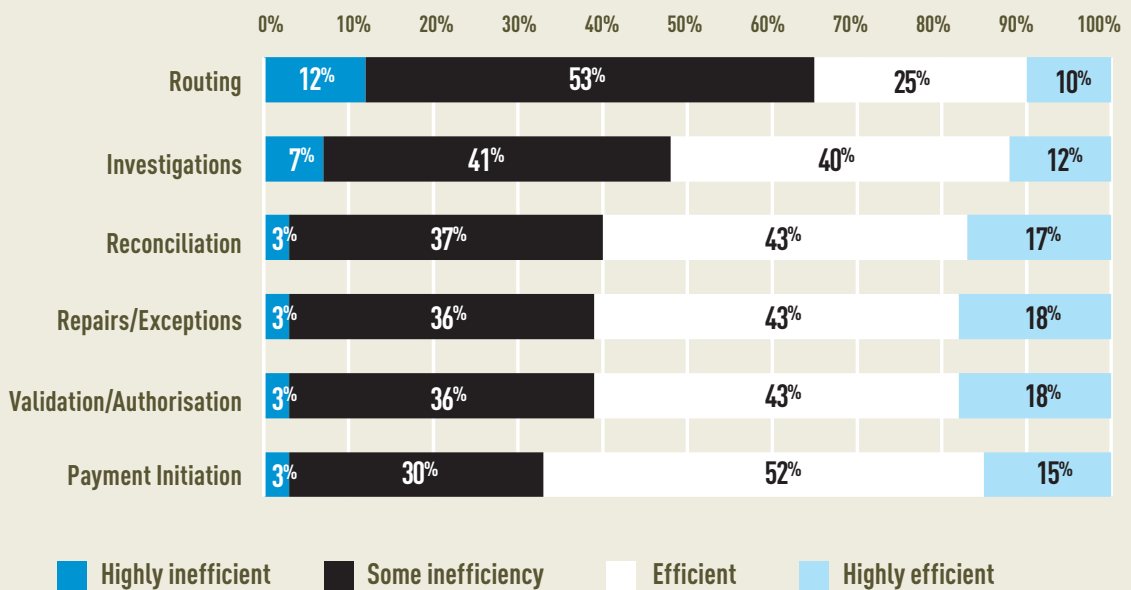
	Highly inefficient	Some inefficiency	Efficient	Highly efficient
Routing	12%	53%	25%	10%
Investigations	7%	41%	40%	12%
Reconciliation	3%	37%	43%	17%
Repairs/Exceptions	3%	36%	43%	18%
Validation/Authorisation	3%	36%	43%	18%
Payment Initiation	3%	30%	52%	15%

- Highly inefficient
- Some inefficiency
- Efficient
- Highly efficient

05
ADDRESSING THE CHALLENGES: WHAT'S BEING DONE?

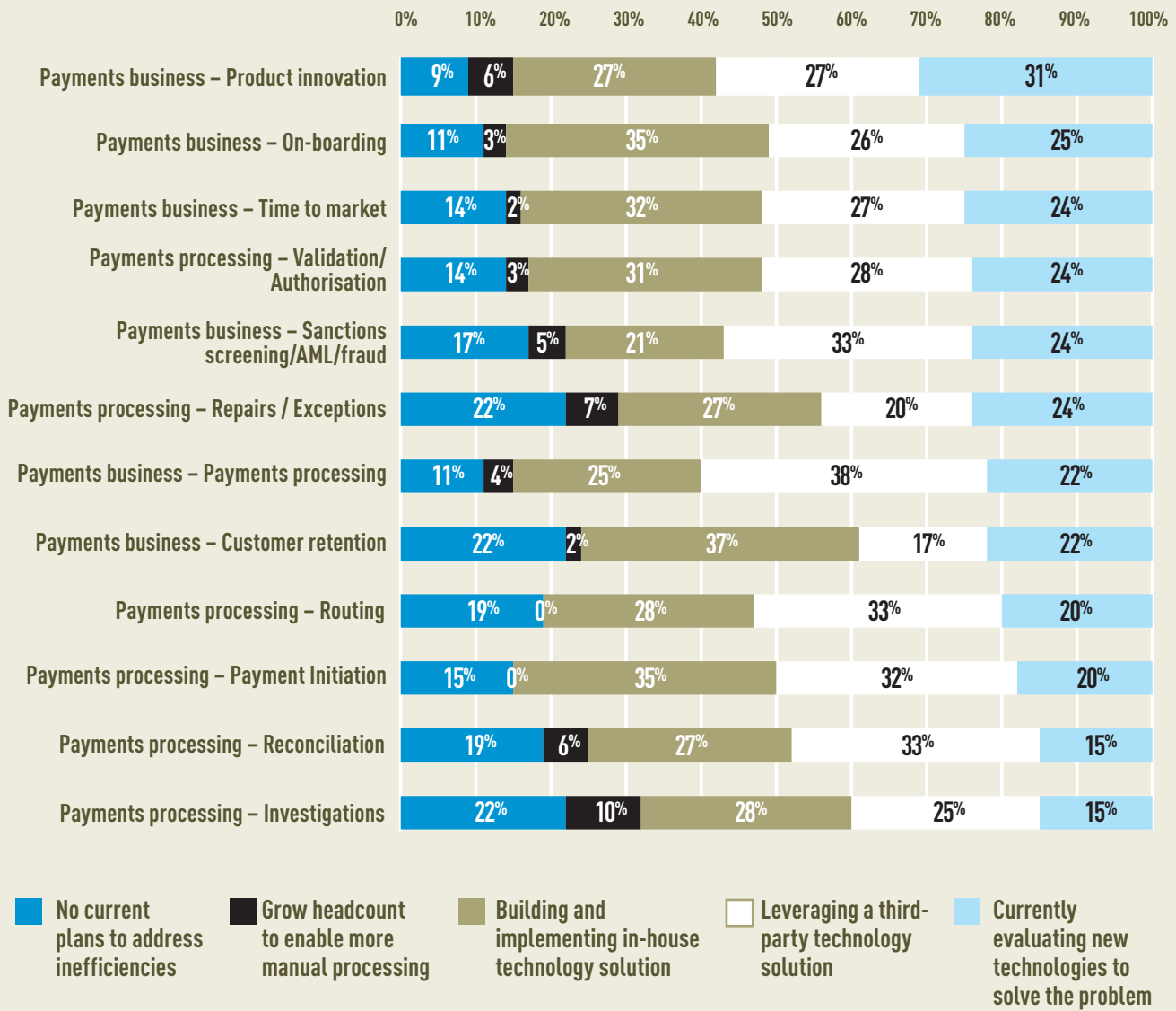## New technology being evaluated to tackle inefficiencies

Organisations aware of their biggest challenges and areas of the payments business where efficiency needs to be improved can react in various ways. As resources are finite, some inefficiencies need to be accepted for now, while other areas are prioritised for improvement. Projects are under way at many organisations to develop inhouse solutions or implement third-party vendor solutions. And evaluations are being conducted at others to understand how new technology can best be applied to the problem areas.

The most common area for current evaluation of new technology is product innovation, with 31%. This is followed closely by onboarding, time to market, validation, sanctions screening and repairs and exceptions.
Across all respondents, customer retention and onboarding are the areas most commonly being addressed by inhouse development. Initiation, processing, routing, screening and reconciliations are more likely to be be targeted with vendor solutions.

Organisations in Western European are more likely to be building and implementing inhouse technology for payments processing, with 34% doing so, compared to just 10% for the rest of the world. They are also more likely to be growing headcount for manual handling of payment initiation, with 27% indicating this, as opposed to 0% for those outside Western Europe, who were much more likely to be leveraging a third party solution for initiation (40% to 18%) and routing (48% compared to 25% in Western Europe).

4. WHICH OF THE OPTIONS BELOW BEST DESCRIBES YOUR CHOSEN SOLUTION TO REDUCE INEFFICIENCIES IN YOUR PAYMENTS BUSINESS AND PAYMENTS PROCESSING OPERATIONS? PLEASE ANSWER ONLY THOSE SECTIONS THAT ARE APPLICABLE TO YOUR BUSINESS.

Category	No current plans to address inefficiencies	Grow headcount to enable more manual processing	Building and implementing in-house technology solution	Leveraging a third-party technology solution	Currently evaluating new technologies to solve the problem
Payments business – Product innovation	9%	6%	27%	27%	31%
Payments business – On-boarding	11%	3%	35%	26%	25%
Payments business – Time to market	14%	2%	32%	27%	24%
Payments processing – Validation/Authorisation	14%	3%	31%	28%	24%
Payments business – Sanctions screening/AML/fraud	17%	5%	21%	33%	24%
Payments processing – Repairs / Exceptions	22%	7%	27%	20%	24%
Payments business – Payments processing	11%	4%	25%	38%	22%
Payments business – Customer retention	22%	2%	37%	17%	22%
Payments processing – Routing	19%	0%	28%	33%	20%
Payments processing – Payment Initiation	15%	0%	35%	32%	20%
Payments processing – Reconciliation	19%	6%	27%	33%	15%
Payments processing – Investigations	22%	10%	28%	25%	15%

Legend:
- No current plans to address inefficiencies
- Grow headcount to enable more manual processing
- Building and implementing in-house technology solution
- Leveraging a third-party technology solution
- Currently evaluating new technologies to solve the problem

06
CURRENT STATUS OF AI: OPINIONS AND IMPLEMENTATIONS

Most see potential, but many need more proof of benefits

Market leading technology vendors are increasingly adding AI capabilities to their products and roadmaps, and AI specialists are turning their focus to the financial services sector as a logical place to turn the AI theories of natural language processing and machine learning into business value. But because of the connotations of AI in the popular consciousness, it can be prone to hype and fearmongering.

As it becomes a more mainstream component of business technology, and as use cases evolve and the impact is made measurable, this is likely to change. But already there is strong agreement that, in the area of payments, AI has potential. Our survey shows 45% agree or strongly agree that there is strong potential for AI to address remaining inefficiencies in their payments business and operations compared to just 10% who disagreed or strongly disagreed. (45% were on the fence).

But there are potential hurdles to realising this potential, with 33% agreeing or strongly agreeing that AI is unproven in critical payments processes and they would struggle to get management buy-in for investment as a result. This would be a significant obstacle for investment in an entirely new AI solution – with the existing operating platforms set up to consume its services – but less of a problem for AI capabilities being introduced into solutions that are already powering payments operations across many organisations.

27% of respondents believed that AI is already proven enough in banking and can be relied upon to drive payments processing, with only 18% in disagreeing or strongly disagreeing.

11% of respondents said they have actually demonstrated that it can be relied upon, and claim that AI is already an integral part of their payments infrastructure. In question 7 we drilled down further to investigate what problems AI is being applied to.

Sanctions screening and AML the start point for many

Across all areas of the payments business and operations, the majority of respondents had no AI implementation. But a significant number of respondents are actively investigating options in all areas, and sanctions screening already has inhouse or vendor supplied AI capabilities at 26% of organisations.

Sanctions screening has been the starting point for many organisations, possibly because the way AI can be applied can easily be understood and checking against sanctions has become an essential activity for most organisations involved in payments.

Using natural language processing it is possible to scan and understand unstructured and free-format text from financial instruments and documents and convert to standard message formats if required. And using machine learning, a system can learn through experience and understanding of context what can pass through the sanctions filter, and what compliance obligations need to be checked, thus reducing false positive rates.

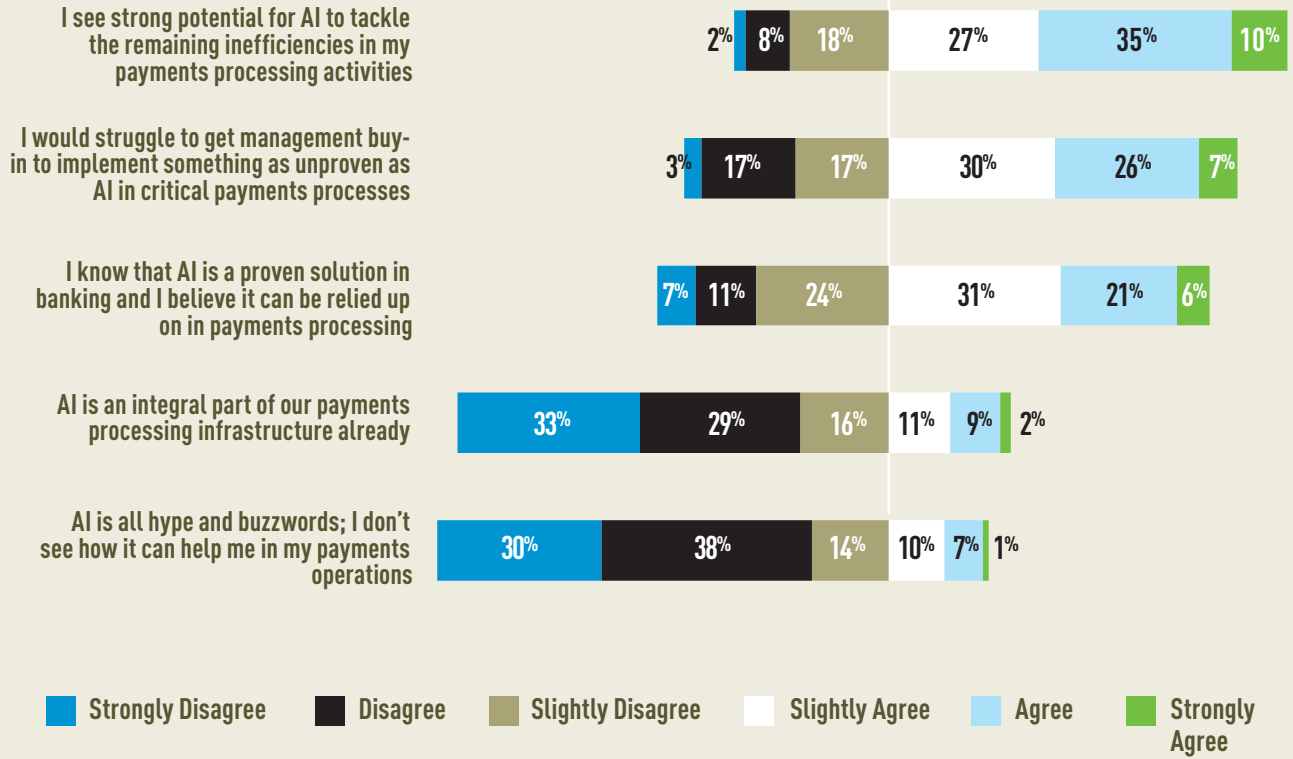## New areas of evaluation for AI

Mirroring the previous question about evaluating new technology generally, the areas currently most being investigated specifically for new deployment of AI technologies are product innovation (33%) and repairs/exceptions (27%).

While onboarding and time to market were also high for general evaluation of new technology, when it comes to AI specifically they are ranked slightly lower.

Artificial Intelligence or machine learning is an untapped, yet to be tested but potentially huge benefit to the financial services sector. The challenge is how to best present the value and demonstrate it in a measurable, quantifiable way.
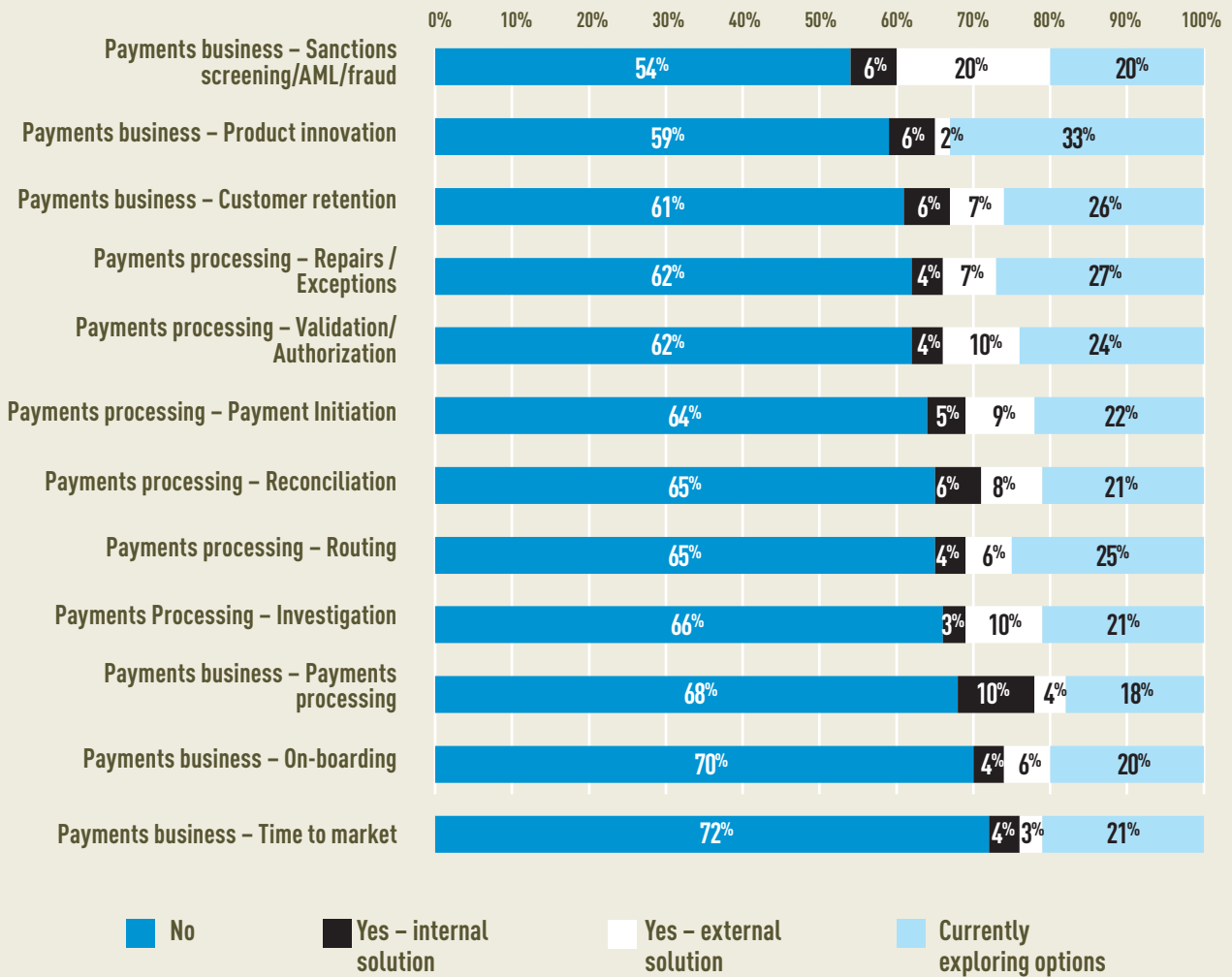DIRECTOR, UNITED KINGDOM

5. PLEASE INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENTS ABOUT ARTIFICIAL INTELLIGENCE (AI)

I see strong potential for AI to tackle the remaining inefficiencies in my payments processing activities
2% | 8% | 18% | 27% | 35% | 10%

I would struggle to get management buy-in to implement something as unproven as AI in critical payments processes
3% | 17% | 17% | 30% | 26% | 7%

I know that AI is a proven solution in banking and I believe it can be relied up on in payments processing
7% | 11% | 24% | 31% | 21% | 6%

AI is an integral part of our payments processing infrastructure already
33% | 29% | 16% | 11% | 9% | 2%

AI is all hype and buzzwords; I don't see how it can help me in my payments operations
30% | 38% | 14% | 10% | 7% | 1%

■ Strongly Disagree ■ Disagree ■ Slightly Disagree □ Slightly Agree ■ Agree ■ Strongly Agree

6. DO YOU HAVE AI TECHNOLOGIES CURRENTLY DEPLOYED IN ANY OF THE FOLLOWING AREAS OF YOUR PAYMENTS BUSINESS OR PAYMENTS PROCESSING OPERATIONS? PLEASE ANSWER ONLY THOSE SECTIONS THAT ARE APPLICABLE TO YOUR BUSINESS.

	No	Yes – internal solution	Yes – external solution	Currently exploring options
Payments business – Sanctions screening/AML/fraud	54%	6%	20%	20%
Payments business – Product innovation	59%	6%	2%	33%
Payments business – Customer retention	61%	6%	7%	26%
Payments processing – Repairs / Exceptions	62%	4%	7%	27%
Payments processing – Validation/ Authorization	62%	4%	10%	24%
Payments processing – Payment Initiation	64%	5%	9%	22%
Payments processing – Reconciliation	65%	6%	8%	21%
Payments processing – Routing	65%	4%	6%	25%
Payments Processing – Investigation	66%	3%	10%	21%
Payments business – Payments processing	68%	10%	4%	18%
Payments business – On-boarding	70%	4%	6%	20%
Payments business – Time to market	72%	4%	3%	21%

Legend: No | Yes – internal solution | Yes – external solution | Currently exploring options

07
BENEFITS FROM AI: WHAT IS EXPECTED?

Understanding content and context from unstructured data

Those evaluating AI technology for their payments operations will be looking for proof of product capability and also understanding of the concrete, measurable benefits it could provide.

We provided definitions for what natural language processing and machine learning aim to achieve, and based on current understanding of the technology and how it has been deployed in transaction banking so far, asked respondents to say how much areas of their business would benefit if the technology could deliver on its promise.

If a solution were able to read and understand unstructured and free format text like a human, 55% to 74% of respondents said they would expect some benefit or significant benefit across all areas of payments business and operations. The highest aggregate benefit score was again for sanctions screening and AML activities (74%). This was followed by customer retention (71%) and onboarding (70%).

Onboarding new customers is a process that comes with a lot of documentation, and it's not always in a standardised form. Being able to read and understand supplied documentation that is required for bringing on new businesses and individual customers could enable a system to speed up the onboarding process and improve customer satisfaction.

The application of natural language processing and context to the challenge of customer retention could include monitoring of news stories, social media activity and unstructured transaction-related documents. Combined with a knowledge base and machine learning of patterns and results, opportunities could be identified to provide excellence in service or to price services differently depending on business context, to keep customer satisfaction high.

Across all areas, respondents outside Western Europe were more likely to see significant benefit from understanding and giving context to unstructured data, and less likely to ascribe no benefit. In the biggest area of difference, 40% of Western European respondents saw significant benefit for sanctions screening and AML, but for respondents outside Western Europe that number was 75%.
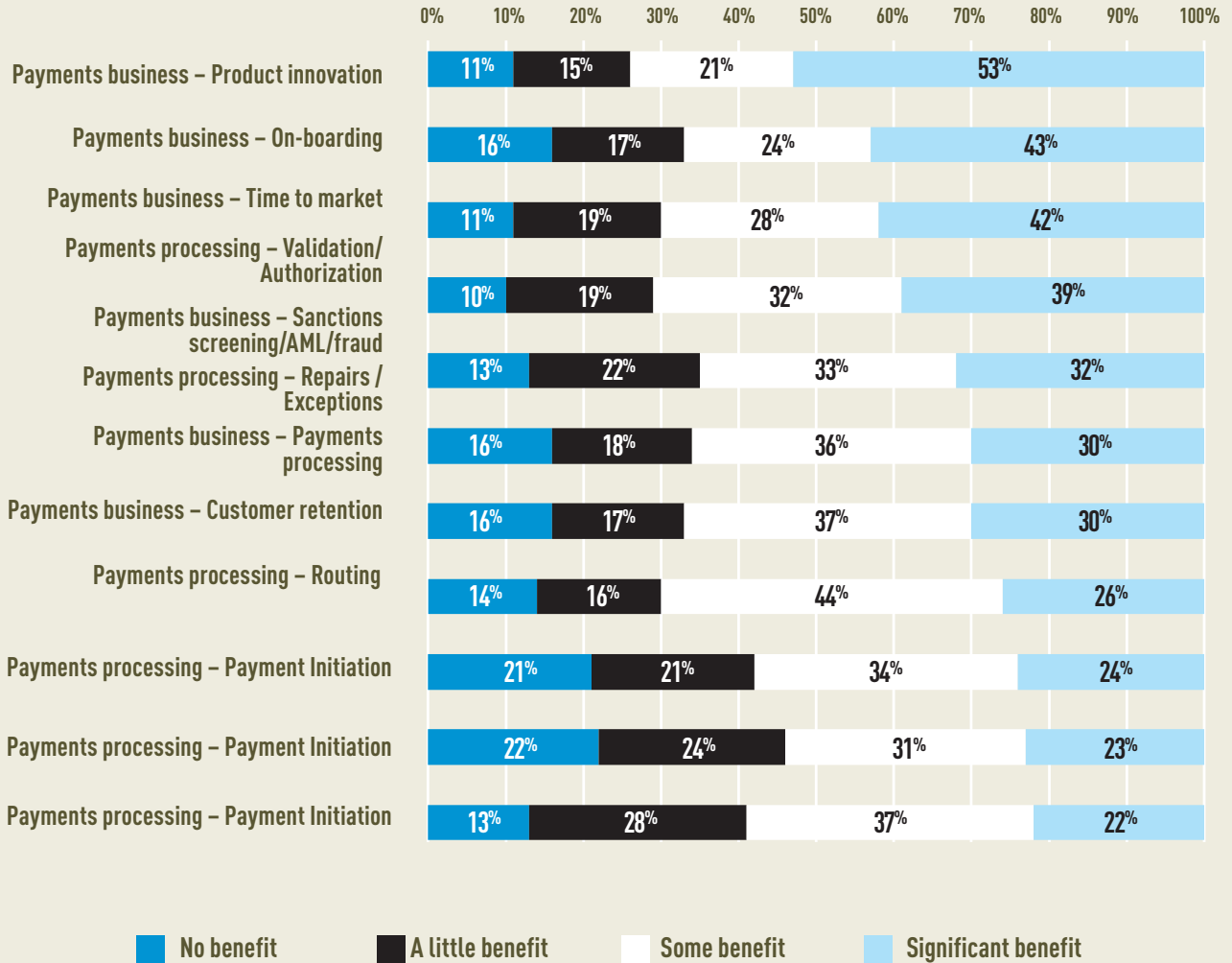
Learning from experience

For machine learning – the ability of a system to be able to learn and improve its actions based on previous experience and patterns of behaviour – the rate of respondents indicating potential benefits was even higher. There was a 62% – 89% range across all areas. Sanctions screening, customer retention and repairs/exceptions again ranked highly.

Similar to the question about unstructured data, respondents outside Western Europe were more positive about the impact of machine learning across all areas of their payments business and operations. 68% thought it could be of significant benefit to customer retentions, compared to just 37% of Western European respondents. It was 52% compared to 22% for onboarding.
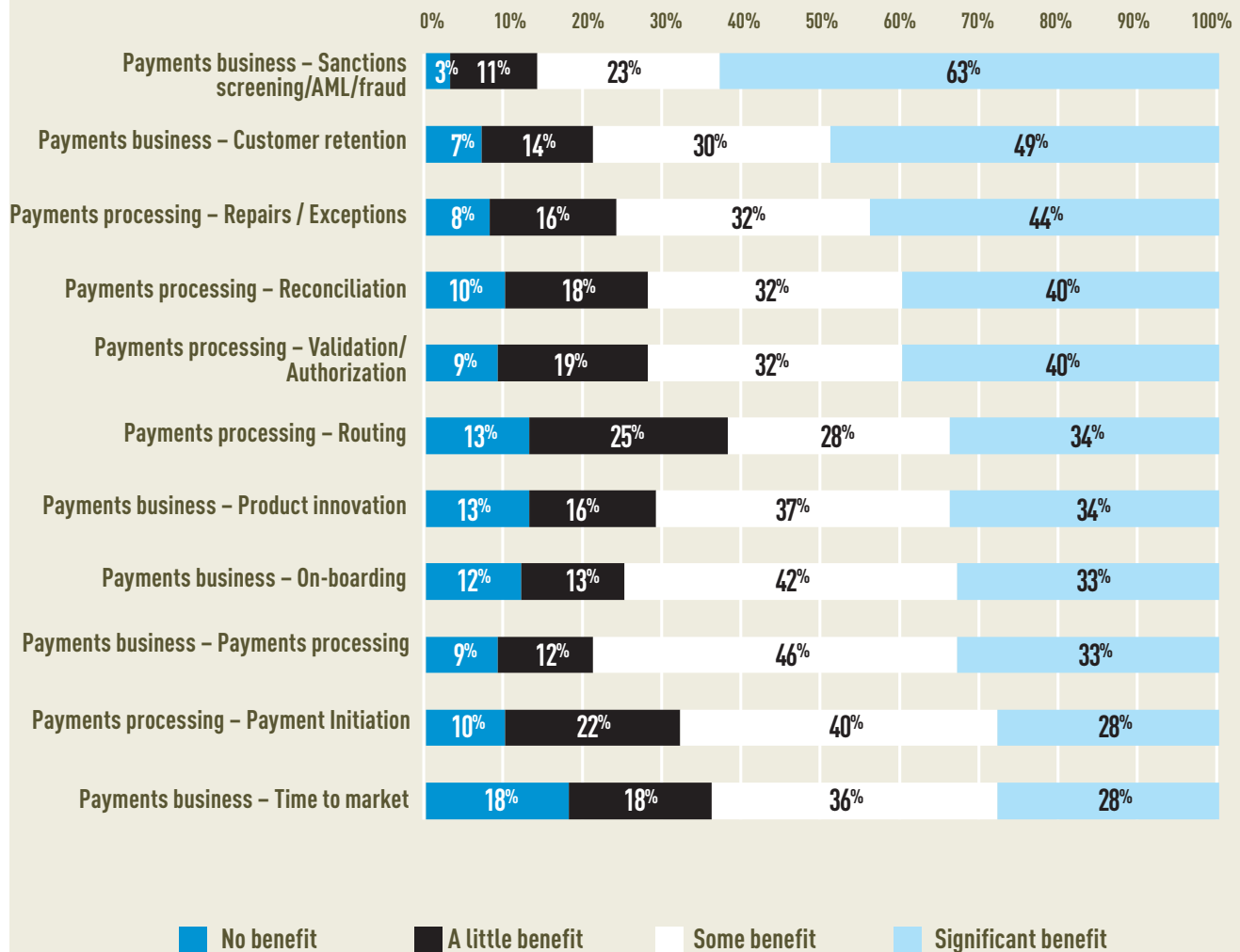
In the area of routing, which the survey shows is the most problematic area of payments processing, there is less awareness of the potential for AI to provide benefits. Indeed, it was considered the area that would benefit the least from both natural language processing and machine learning.

In order to do routing well in payments the operator needs to understand extremely well all available options and the full payments lifecycle. Different organisations will route differently depending on their customer, the type of payment, the destination and their position in the payments chain. It's very complex and to do it well requires deep domain expertise. So, instinctively many respondents appear to believe that to automate this is very difficult, even with AI. But if AI systems could be demonstrated to have this payments domain expertise as a built in knowledge base, on top of which machine learning could iteratively improve the solution's decision making, then routing could well become a hot new area for AI in payments.

7. IF A SOLUTION WERE ABLE TO READ AND UNDERSTAND UNSTRUCTURED AND FREE FORMAT TEXT LIKE A HUMAN, WHICH AREAS OF YOUR PAYMENTS BUSINESS AND PAYMENTS PROCESSING OPERATIONS DO YOU BELIEVE WOULD BENEFIT THE MOST FROM THIS? PLEASE ANSWER ONLY THOSE SECTIONS T

Category	No benefit	A little benefit	Some benefit	Significant benefit
Payments business – Product innovation	11%	15%	21%	53%
Payments business – On-boarding	16%	17%	24%	43%
Payments business – Time to market	11%	19%	28%	42%
Payments processing – Validation/Authorization	10%	19%	32%	39%
Payments business – Sanctions screening/AML/fraud / Payments processing – Repairs / Exceptions	13%	22%	33%	32%
Payments business – Payments processing	16%	18%	36%	30%
Payments business – Customer retention	16%	17%	37%	30%
Payments processing – Routing	14%	16%	44%	26%
Payments processing – Payment Initiation	21%	21%	34%	24%
Payments processing – Payment Initiation	22%	24%	31%	23%
Payments processing – Payment Initiation	13%	28%	37%	22%

Legend: No benefit | A little benefit | Some benefit | Significant benefit

8. IF A SOLUTION WERE ABLE TO LEARN AND IMPROVE ITS ACTIONS BASED ON PREVIOUS EXPERIENCE / PATTERNS OF BEHAVIOUR, WHICH AREAS OF YOUR PAYMENTS BUSINESS AND PAYMENTS PROCESSING OPERATIONS DO YOU BELIEVE WOULD BENEFIT THE MOST FROM THIS? PLEASE ANSWER ONLY

Area	No benefit	A little benefit	Some benefit	Significant benefit
Payments business – Sanctions screening/AML/fraud	3%	11%	23%	63%
Payments business – Customer retention	7%	14%	30%	49%
Payments processing – Repairs / Exceptions	8%	16%	32%	44%
Payments processing – Reconciliation	10%	18%	32%	40%
Payments processing – Validation/Authorization	9%	19%	32%	40%
Payments processing – Routing	13%	25%	28%	34%
Payments business – Product innovation	13%	16%	37%	34%
Payments business – On-boarding	12%	13%	42%	33%
Payments business – Payments processing	9%	12%	46%	33%
Payments processing – Payment Initiation	10%	22%	40%	28%
Payments business – Time to market	18%	18%	36%	28%

No benefit   **A little benefit**   **Some benefit**   **Significant benefit**

08
AI IN PAYMENTS: THE ROAD AHEAD

A desire for market education and proof points

To get a picture of where AI is headed in payments, the survey's final question used a Likert scale to gauge levels of agreement with a number of statements. Less focus is placed on the more neutral responses around the middle of the scale.

There is a clear desire for more specifics and proof points around AI technology and its application that makes a distinction from the way AI is positioned in the consumer market and the popular consciousness. 70% agree or strongly agree that there's a need for more industry awareness of how AI technologies can apply in transaction banking. There was also strong agreement that AI could be integral in addressing the challenges and remaining areas of inefficiency (59%).

Although the survey question about technology deployments generally showed a fairly even split of inhouse and vendor solutions being deployed, when it comes to AI there is a belief by 58% of respondents that it's better to tap into established service providers to leverage their expertise. Only 9% believed it was better to pursue these solutions inhouse.

On the subject of the timeframe for AI becoming mainstream, there was high indecision, but 33% expected it to definitely become more widely adopted within two years. Only 8% were in disagreement or strong disagreement with this prediction.

> **AI technologies have the ability to significantly change the way payment processing is done and we hope to leverage the technology in the future.**
> **HEAD, INFORMATION SECURITY AND STANDARDS, NIGERIA**

9. PLEASE INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENTS ABOUT ARTIFICIAL INTELLIGENCE (AI)

I think the industry needs to gain a better understanding of how AI technologies apply in transaction banking – as opposed to the hype around AI in consumer tech
1% 2% 5% 22% 40% 30%

I believe AI technologies could be integral in helping my organisation tackle the challenges in our payments business, payments processing operations and compliance
0% 3% 9% 29% 39% 20%

I believe it is better to tap into established AI solution providers to benefit from extensive experience in this domain
1% 2% 6% 33% 39% 19%

I believe that in the next 24 months, the adoption of AI technologies by banks to improve efficiencies in payments will have increased significantly
2% 6% 25% 34% 26% 7%

I believe it is better to develop AI solutions in-house
15% 31% 25% 20% 6% 3%

I don't see how AI can help me to improve efficiency in my payments business, or to tackle the challenges my business faces
29% 32% 19% 15% 3% 2%

Legend:
- Strongly Disagree
- Disagree
- Slightly Disagree
- Slightly Agree
- Agree
- Strongly Agree

09
INDUSTRY OPINION

THE PROMISE OF PLUG AND PLAY FLEXIBILITY

By David Bannister, Principal Analyst
Financial Services Technology, Ovum

Artificial intelligence (AI) is not new. The technologies that fall under the AI banner — which, depending on your point of view, can include natural language processing, knowledge-based systems and machine learning among others – have been around for many years, and their potential to herald improvements in efficiency and service delivery in a range of industries has long been discussed.

In sectors like healthcare and telecoms great strides have been made recently in implementing AI, and the technology is not new to the financial industry either. Algorithmic trading, for example, is a well-established application of one form of AI in the financial markets.

The most important development which has changed the game for AI in recent years is improvements in processing power and networks. Talk of how the technology could be applied for key applications in payments goes back a long way – to the 1970s even – but the capability today of computers and networks makes implementations much more feasible, because the ability to perform tasks at speed, in parallel and at scale are key to usable AI applications.

In this context AI can be a powerful element of a payments hub strategy, with the hub a natural place to deploy AI to perform functions complementary to payments processing.

Applying AI to automate the last remaining elements of manual exception handling also becomes a plausible strategy, leveraging the ease and flexibility of deployment the technology makes possible. With earlier generations of technology, it was possible to automate exception handling based on business rules, but deployment depended on a consultant coming in, assessing the payments types to be managed, and putting in place the business rules needed – and when a new payments type was thrown into the mix, new rules had to be added as well.

By contrast, AI-based systems can automatically recognise payments types and offer the prospect of a USB-like plug and play exception handling capability. An AI-enabled hub could, for instance recognise the format of an incoming transaction more flexibly than a rules-based one, making a "best guess" approximation, selecting an appropriate routing choice and learning when it gets it right or wrong to improve the accuracy of its next decision.

There are certainly some strong drivers for banks to harness the potential of AI in payments. It will not be long before real-time payments across borders are commonplace, adding yet more complexity to the network of payments systems through which market players will need to route transactions. The payments environment will only continue to change – and even if the promise of blockchain to simplify cross-border payments is realised, there will still be change to be managed.

Automating routing – relying on AI to make decisions about what to send where – will enable new levels of efficiency and could be a critical differentiator from a cost and even a service delivery perspective. As the survey results show, the industry finds routing a highly problematic area of payments processing – requiring deep understanding of all the available options and the full payments lifecycle. Transactions are routed differently for each customer, payment type, destination and according to organisations' positions in the payments chain. In other words, doing routing well is difficult and requires domain expertise – and banks continue to view it as difficult to automate.

AI can help. AI-based systems can have payments domain expertise built in – to a far greater extent than the accept/reject model of a rules engine – and can iteratively improve their decision making. In the increasingly complex world of payments processing, AI could be well worth considering as a tool to help tackle that complexity flexibly, efficiently and cost-effectively.

BROADENING THE AI HORIZON

**By Kevin Brown, Independent Non-Executive Director
& Senior Advisor, Payment Industry Insights**

As the results of this survey show, artificial intelligence (AI) is already making an impact in payments. We are seeing first movers exploit AI, especially in the areas of routing and sanctions screening, and I would view these as very logical initial areas to deploy the technology in payments.

However, there are number of opportunities to extract additional value from AI as well. In the context of testing, validation and oversight of compliance activities, several banks are already looking at how they could leverage AI to 'check the checkers'. This would be a similar application to the examples we see in trading environments of running AI solutions alongside traders to identify anomalies.

While within existing organisations there is a natural tendency to want to test AI against the processes that you are using it to replace, there may be greater benefits in areas in which it might be more difficult to directly benchmark AI's performance – for example leveraging the technology to deliver substantive improvements in service delivery. Using AI to analyse customer interactions in a much more intuitive way than is possible with the typical approaches could allow product and service enhancements on a continual basis. Additionally, the inclusion of greater data carried with payment messages also offers potential benefits in exploiting AI.

For me the survey results confirm that payments players are embracing the new technology and are taking a careful and conservative approach to its adoption. Given the need for accuracy, resilience and compliance, this is a prudent approach; however, there are opportunities to broaden the scope of AI usage in payments.

The prudent approach seen is also underpinned by the regulatory environment in which banks continue to operate. Clearly there is a much higher threshold in terms of risk appetite to fully utilise AI in the core payments areas versus the other business and service environments with less rigorous regulatory oversight. As we have seen with adoption of other technologies in the financial markets, for example the use of cloud services, regulatory acceptance is a key part of broadening usage and application.

There are certainly strong drivers for the financial industry to embrace the potential of AI to its fullest. Given many financial institutions remain under constant pressure to reduce and control costs, AI has the potential to make a positive impact on cost base as well as improve customer experience.

It is also interesting that new entrants to banking and payments typically already think differently about AI. Because they are using AI from day one, rather than to replace successfully what they have been doing by different means, they have no nervousness about AI meeting benchmark performance thresholds. They are free to take full advantage of AI's potential to drive better customer engagement at

low cost and it is built in to their design process. This will give the new entrants significant benefits as AI allows them to learn from customer activity and respond quickly to changing needs.

Finally, I suspect that to maintain momentum, existing payments providers will need to forge strategies to become more agile in testing and deploying AI, especially as the payment data carried increases, to make sure they are also extracting the maximum benefit from this exciting technology development.

FUTURE PROOFING THE CORPORATE TECHNOLOGY STACK

Alain Falys, Serial Technology Entrepreneur and Investor

The survey results show that banks have a some understanding of artificial intelligence (AI) and what it means for their business. They are clearly more receptive to AI than the corporates are – and to some extent this is to be expected. Banks historically have ventured sooner and deeper into technology, and today the banking business IS technology by and large.

The banks get on to technology first because it's their job to offer technology based services to their corporate customers, and hence the corporates tend to be followers. AI is no different. Many corporates are putting less emphasis on this technology so far and have yet to understand its significance for them – but they must do so. AI will affect the way corporates operate all their core systems – their ERP, treasury and payment systems. And whereas we used to think of innovation in five year cycles, the process is now speeding up, significantly.

We all know as consumers that AI is affecting our lives already, and this is indicative of the fact that this science about which we have talked for years is coming to the point where it will have an impact on the way all technology is built, and will be very visible in the way it is used. The time in the development cycle has been reached at which robots operate almost like human beings, and AI will form part of treasury tools, shared transaction banking tools and other key fintech developments that will be exploited by corporates.

The transformative power of AI is that it can replace decision making that would have to be made by many human beings: it is about making the software decide, at scale. Rather than automating per se, AI puts intelligence into automation to solve the "last mile" challenges. This makes possible some innovations that have not been feasible before.

For example, large corporates make thousands of payments a day. Though payments are in a sense commoditized, this activity can nonetheless be expensive if not handled well. Determining the least cost routing of payments is important: if a payment has to be delivered to France tomorrow, there is one choice about its route, if it can be delivered in two or three days' time to Kenya, there is another. Along with the routing, the operational complexity of multiple banks, multiple payment methods, multiple channels and multiple formats makes a simple process of sending payments unduly tedious. This is where AI solutions with operational intelligence and knowledge of the full payments lifecycle can really help.

Making the right choices about the most cost-efficient gateways to use and to schedule the payments optimally to maximise cash balances would make a valuable contribution to efficiency. Historically, a person could do this for one or two transactions – but not for thousands. Achieving least cost routing and scheduling of payments across an entire business is a very attractive proposition made possible by AI's ability to replace human intelligence at scale, and at the same time simplify the complex and tedious operational processes.

In short, AI is a technology that is going to become mainstream, and as a consequence AI should be part of the technology stack corporates consider, especially as they continue to look for technology independence from their banking partners.

Corporate treasurers – just like decision makers in transaction banking – need to understand that if they don't deploy tools that leverage AI, they are potentially not future proofed, and miss failing to manage effectively the cost structures of their organisations. Because if AI is not part of corporates' technology stacks going forward, it will make those technology stacks less efficient than they would otherwise have been.

REAL-TIME DRIVES AI

John Quamina, Principal, QFS Consulting

It is interesting that these survey results indicate that banks view real-time payments as one of the challenging areas of change facing them today. Real-time payments kicked off in Europe and the wave of change has gone east around the world and is now in North America. This wave will make a second lap around the world in a true agile approach, taking the lessons learned from the more recent adoptions to enhance the earlier adopters, for instance ISO 20022 or real-time gross settlement in the UK.

As the earlier analysis indicates, there are geographical differences of opinion, with participants from countries where real-time payment is already in place being more relaxed about their implications. Even so, I think it's important to remember that it's the move to real-time that makes the deployment of artificial intelligence (AI) in payments an absolute necessity.

Imagine if, during your experience of using Uber, the normally frictionless payment was held up so your identity could be checked. It wouldn't happen of course because the whole Uber model makes the payment process disappear – but this serves as a good illustration of the problems that could occur if, when the real-time phenomenon makes itself felt beyond retail payments in the corporate and transaction banking environments, all the other activities associated with those payments fail to keep pace.

Put bluntly, with the move from batch and multi-day to real-time in transaction banking, there won't be time for any human intervention in payments. We are all familiar with real-time in cards and Faster Payments in the UK (and similar schemes elsewhere) – and though the move up the value chain to corporate payments is yet to come, it is not far away. The first use cases for real-time payments in the US are business payments. The revenue potential of real-time is almost entirely driven by high-value payments, and that is increasingly where the focus will be. And real-time will go cross-border within five years.

To underpin real-time payments, all the supporting processes – AML checking, various customer service-related activities – will need to happen in real-time as well, and here AI needs to play a major role. The situation today, where many banks are running significant operations departments full of people processing payments that don't meet the criteria for automation and therefore become exceptions, is not sustainable. AI is what will enable banks to bring automation to exception processing – handling investigations, fraud and sanctions checking in real-time – and allowing banks to deliver on real-time with the necessary efficiency and speed.

As the survey shows, 'time to market' is a significant challenge for banks – in fact, the respondents indicate it is becoming a bigger challenge than regulatory compliance, and is the area of the payments business with the highest inefficiency. As the world moves quickly to real-time, 'time to market' will mean staying with the market, and from a technology roadmap standpoint this means building in agility and continually simplifying.

The good news is that AI is not an extraordinary technology. AI is simply logic, coupled with very fast computers which allow that logic to perform very quickly – which is why AI now makes sense as a technology that can be realistically implemented to carry out functions at scale and speed. AI is ready for mainstream use to support widespread real-time payments. The challenge is in determining the use cases.

In this regard, it is important not to view AI in isolation. We are on a trajectory in payments, moving from the old world to the new world. No bank will make this happen in a very short period of time, but each must understand its product roadmap for the next 5-10 years, its response to the real-time transformation of transaction banking, and then map the platforms it will need to deliver them. The areas in which AI should be brought to bear will become clear, not just to solve problems today, but to enable future payment opportunities tomorrow.

It is no surprise that respondents to the survey strongly agree with the sentiment that "the industry needs to gain a better understanding of how AI technologies apply in transaction banking". Often people in the business who understand the current operations don't understand what the technology can do, and the technologists have no idea about operations or the complexity of payments.

Every individual will fall into one camp, but bringing them into the same room creates an opportunity to clarify how AI will empower the next generation of operations and IT, to enable banks to both survive and thrive in a real-time world.

IT'S ALL ABOUT THE DATA

**Keith Saxton, Chairman of the Financial Services
& Payments Programme, techUK**

Artificial intelligence (AI) is something of a catch-all phrase, and I find it useful to remember that today, in addition to other subsets such as machine learning and cognitive computing, an important component is big data and analytics. There is a danger, when talking about AI, of wandering into the realms of sci-fi, and in the payments context there is also a tendency to mix up different issues, confusing the payments process with the data needed to drive it.

Modern technologies can be applied across the payments value chain, but there are some areas on which it is worth focusing more strongly than others. When it comes to that all-important driver to improve the customer experience, the data and analytics pieces are clearly key.

The reality of 'mobile first' is critical here: as well as requirements around security and identity, mobile is driving the opportunity to improve customer experience by providing customised offers and other content around payments, as well as AI-driven voice and bot-based services.
Another adjunct to payments, the integration with e-commerce, is also ripe with opportunity for banks to better leverage account information and more effectively emulate what providers such as Amazon do with data off the back of e-commerce. Analytics, machine learning and any new AI-type technology that will come along could have a role to play here.

Underpinning all of this is the issue of authentication. The need to establish identity is vital to the payments market, not just in consumer but in commercial payments. We will see cyber regulation in the US and Europe provide further focus. Another data requirement, authentication will become one of the big drivers for developing the intelligence side of AI, delivering on the vision of real-time risk management.

When it comes to practical adoption paths for banks, it's clear that they can't get from where they are today to where they need to be in one straight line – directly from complex, silo-based legacy core to a fully AI-enabled payments system. They need to be pragmatic – as usual. AI is not so different to any other technology. It's simply an algorithmic approach. And if it's the business that will drive this – rather than IT – then there is a need to start with very strong use cases. Of course it is through emerging fintech that smart solutions to parts of the payments value chain are being developed, adding pressure and urgency to banks' modernisation efforts.

The primary goal is to be established as a very strong payments processing business – with the best capabilities and the lowest cost per unit. Once a bank is established as a powerful payments utility, then it can concentrate on extracting the data required to underpin its AI implementations. These need to be based on relevant use cases. If your bank has just been fined for a sanctions breach, then your top use case could be an AI-enabled early warning system. The focus should be at the sharp end of your needs, on well-defined use cases.

Secure, high volume payments processing is well-understood. The trick will be to maximise the potential of what can be achieved by releasing data out of legacy and closed systems. Take an enterprise view and work out where there are opportunities to do much better. One area to look at for many banks could be the SME segment. Payments-wise, these customers' needs aren't the same as those of consumers or big corporates. SMEs need new services based on what banks can determine about their requirements by tapping into their knowledge of, and integration into, the SME world.

Banks are limited by their legacy, and it will be challenging for them to access the data they need, but if they can overcome this challenge then AI holds the potential for banks to turn their data into knowledge, and to offer improved security, authentication and security around payments, to the benefit of customers across the spectrum.

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ABOUT

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