

Gaining an edge with operational intelligence and AI

Infusing AI into business process flow monitoring opens endless possibilities



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Forewarned is forearmed



It's just a matter of time before artificial intelligence (AI) is embedded throughout the enterprise, and it is up to CIOs and other technology leaders to ensure that everyone – from the CEO through senior staff to managers – understands how it will affect their organization and their job.

In this eBook, created in partnership between AI Business and innovative software vendor DRYiCE, a division of HCL Technologies focused on building industry-leading products, we look at both emerging trends and specific use cases in deploying AI for business. We look at the broader components of a well-functioning digital enterprise, like data management and business flow monitoring, and pay special attention to the financial services sector, which is pioneering many of the more recent AI use cases.

This eBook covers areas including buy-in, culture, ethics, the future of AI, the obstacles to implementation and the likely impact across different industries.

We hope this guide will provide useful insight and help IT and business leaders to incorporate new technologies into their digital transformation strategies.

Max Smolaks | Global Editor | AI Business



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Step forward: Artificial Intelligence



While hardware and software should never be considered the panacea to any business problem, some technologies can help support, or even drive through digital transformation programs. Artificial intelligence-based systems are becoming essential to modern enterprise strategies – and there is clearly a trend to invest in AI going forward.

Omdia forecasts that annual worldwide revenue for enterprise applications of AI will increase from \$7.6bn in 2018 to \$99bn in 2025. Data gathered by LearnBonds ([web link](#)) suggests that the global AI software market value will jump from \$22.6bn in 2020 to \$126bn by 2025.

There is an enormous appetite for AI in business; when Gartner asked CIOs and IT leaders to identify which technologies they expected to be the most disruptive, AI was the most frequently mentioned technology by a long distance, with data and analytics coming in second. But CIOs aren't just looking at AI technologies from afar –

in the same study, 37% reported that they had already deployed some AI tech, or that deployment was expected in the short term.

Gartner warned that this rise in adoption may not be revolutionary and may instead indicate “irrational exuberance.”

“While CIOs can't afford to ignore this class of technologies, they should retain a sense of proportion. This latest batch of AI tools is yet to go through its trough of disillusionment,” said Andy Rowsell-Jones, VP and distinguished analyst at Gartner ([web link](#)).

In a CIO survey conducted by Harvey Nash and KPMG in 2019, only 4% of CIOs said they saw large-scale adoption of AI in the enterprise, with 17% stating they saw small-scale use of AI, and 20% were at the pilot project stage. The CIO survey suggests that the AI industry is still in its nascency but is being taken seriously by IT decision makers.

While many other areas of AI have more of an appeal to consumers – such as autonomous cars and virtual digital assistants – businesses are keen to see demonstratable uses of AI in the ‘here and now’ that can make an immediate impact. The area in which AI has already moved leaps and bounds is in improving business processes. Machine learning might not be capable of creativity, but it is great at optimizing systems that already exist.

In Omdia's recent AI report, the analyst firm noted that with technological advancements in data processing, storage, memory and networking, computers were now capable of quickly and consistently analyzing large amounts of business data. Unlike humans, machines do not suffer from fatigue, which means better productivity and a reduction in costs.

At the same time, the report warned: “At present, computers are still no match for the human brain, particularly for managing the ‘soft’ aspects of life, such as reading and reacting to emotion or quickly responding and adapting to changing scenarios that could highlight imminent danger or threats. Machines can perform routine tasks, such as pattern recognition, much more accurately and faster than people.”

If C-level executives are looking for a starting point in deploying AI that would help them shift their digital transformation initiatives into gear, then business processes are an excellent place to begin. Many of the tools on the market are not touting themselves as specialist data science tools, but rather business process tools that make use of AI and its subsets such as machine learning.



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How are different sectors using AI?



According to Mark Beccue, principal analyst at Omdia, the priority area that enterprises are looking at is top-line growth, rather than cost optimization.

“AI can do a lot of things, but one of the key things it can do is bring scale, and help make human resources more efficient, eliminating tasks that are redundant,” he said.

Omdia has carried out comprehensive research into different AI verticals and horizontals, mapping out the practical usage of this technology. It has put no fewer than 300 use cases into a database; the idea is to gauge what the possible use of AI is, and what it is worth.

When it comes to AI being used for business processes, fraud detection and anti-money laundering (AML) have emerged as critical applications in the

financial sector. Omdia believes these will continue being the primary use cases between now and 2025. The second-largest area is around patient data processing within the healthcare industry, and the third is around risk assessment and compliance.

“This could be understanding consumers or companies and how they stack up for certain loans – and using algorithms from disparate domains to understand how much confidence the organization has in the individual or business,” Beccue said.

Other crucial business applications that increasingly involve AI include trading within finance, and customer service enhanced with the help of virtual digital assistants (VDAs). Financial institutions were some of the most prominent early adopters of this tech, to cut down the number of queries going into the call center.

It's worth noting that more complex business tasks, or combinations of tasks, will be possible over time – but that these will come with challenges, including moral and ethical decisions that organizations will have to make ([read more about this on page 16](#)).

“The ultimate goal is to see how many systems you can automate to allow humans to focus on the more non-linear thinking or critical thinking required within an enterprise,” Beccue said.



Ian Philips, VP Business Development for DRYiCE iControl, a business process flow monitoring and operational intelligence product, told AI Business that the technological landscape was in flux, affecting the complexity of business processes.

“Previously, the technology was stagnant, with large systems in place that didn't change over time. As the pace of technological change accelerated, the emphasis on business processes has increased because you can't keep changing your outlook on technology. You'll spend all of your money on that,” Ian Philips said.

Instead, he suggested that organizations should be concerned with visibility into their business processes, and manage technology from this standpoint: “You just need to know the service is running and the key metrics are running, so you're less worried about what the technology is doing and more worried about how the business is performing.”

In this scenario, organizations are not distinguishing between business operations and IT operations – they're both just as important, and also dependent on each other.





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So you've decided to transform

“One of the most important parts of business process optimization is the idea behind structured and unstructured data, and in a typical enterprise, there's a combination of both.”

Earlier, we delved into the challenges companies face with digital transformation. Without getting their house in order, many organizations will struggle to effectively use the data they have for AI – because their data is disparate, hard to access, and challenging to analyze.

Omdia's research found that AI faces similar hurdles as other analytics technologies in this respect, but there are steps you can take to take control of your data, and business intelligence that it represents.

You need a data strategy

“To really benefit, you need a 360-degree view of data from different domains and sources, and so the idea of clean and readable data is one of the huge challenges for AI. Data Quality has been a struggle because some of those domains tend to be owned by different departments, and you have to be able to access it,” Omdia's Mark Beccue said.



“When you introduce tools that can improve business processes with AI, you have to ensure that you collapse these functions and work towards a common goal, rather than holding on to your territory,” added Shaker Ladak, Chief Architect for DRYiCE iControl.

Data silos exist within many enterprises. Making all the organization's data accessible and transparent requires businesses to look in-depth at how they are producing, collecting, and storing their data. This is compounded by another big obstacle, data that arrives unstructured.

“One of the most important parts of business process optimization is the idea behind structured and unstructured data, and in a typical enterprise, there's a combination of both. Having the right ways to attack unstructured data is something that typically trips up enterprises when they're using AI to deal with business processes,” Beccue said.

Ian Philips, VP Business Development for iControl, added that he has to warn DRYiCE customers that if they haven't got 90 days' worth of data that is clean and correct, machine learning algorithms won't make an accurate prediction.

“If you think about it, every quarter there is a major event that takes place, such as Halloween or Christmas, and these interfere with the way your data looks so when it comes to using a standard algorithm that's predicting some time, you need a lot of data for a



“This hype is difficult to contain; it is up to CIOs to ensure that CEOs understand how and where AI can really make an impact, rather than procuring the technology for the sake of it.”

whole cycle for it to predict accurately for you,” he stated.

You need visibility

“When I speak to CIOs and CEOs about their business challenges, one of the key things they’re saying is they want to be able to see end-to-end across their business,” Ian Philips said. “A lot of them are saying they don’t own all the necessary bits of the puzzle as they’re either outsourcing parts of the function or buying parts of the function as-a-service.”

Business leaders must understand the relationships between their IT estate and the rest of the organization, to ensure that SLAs have been met in their chain of deliverables. One approach to this is to forget about the technology – and look at it from a process perspective, and then look at which technology is supporting which process to measure the performance of the flow, end-to-end. This enables the responsible parties to answer questions such as ‘who is affected’ and ‘how much.’

“Don’t tell me the database is gone down or the server is gone down, I want to know who is affected – whether its clients or products and tell me the value behind it,” Ian Philips said. Without this kind of superior visibility, organizations may struggle with specific business processes – such as settling a trade on time, making sure goods get out of the door, making a payment, or ensuring reconciliations are completed. Having greater transparency helps ensure that organizations are not fined, and inefficient and ineffective processes have a chance to improve.

You need buy-in

Gaining board approval for digital transformation and then AI projects is often tricky – mainly as digital transformation is meant to be an ongoing process rather than a one-off undertaking and AI projects may yield a return on investment in years, rather than months.



But perhaps a more significant threat to an organization is the belief that AI is the panacea to business problems. In PwC’s 22nd Annual Global CEO Survey ([web link](#)) 85% of respondents agreed that AI would significantly change the way we do business in the next five years, while almost two-thirds said it would be ‘bigger than the Internet,’

This hype is difficult to contain; it is up to CIOs to ensure that CEOs understand how and where AI can really make an impact, rather than procuring the technology for the sake of it. This reverts to the fact that there needs to be an appropriate digital and data strategy in place, and that an AI application must be solving a business issue or creating tangible value.

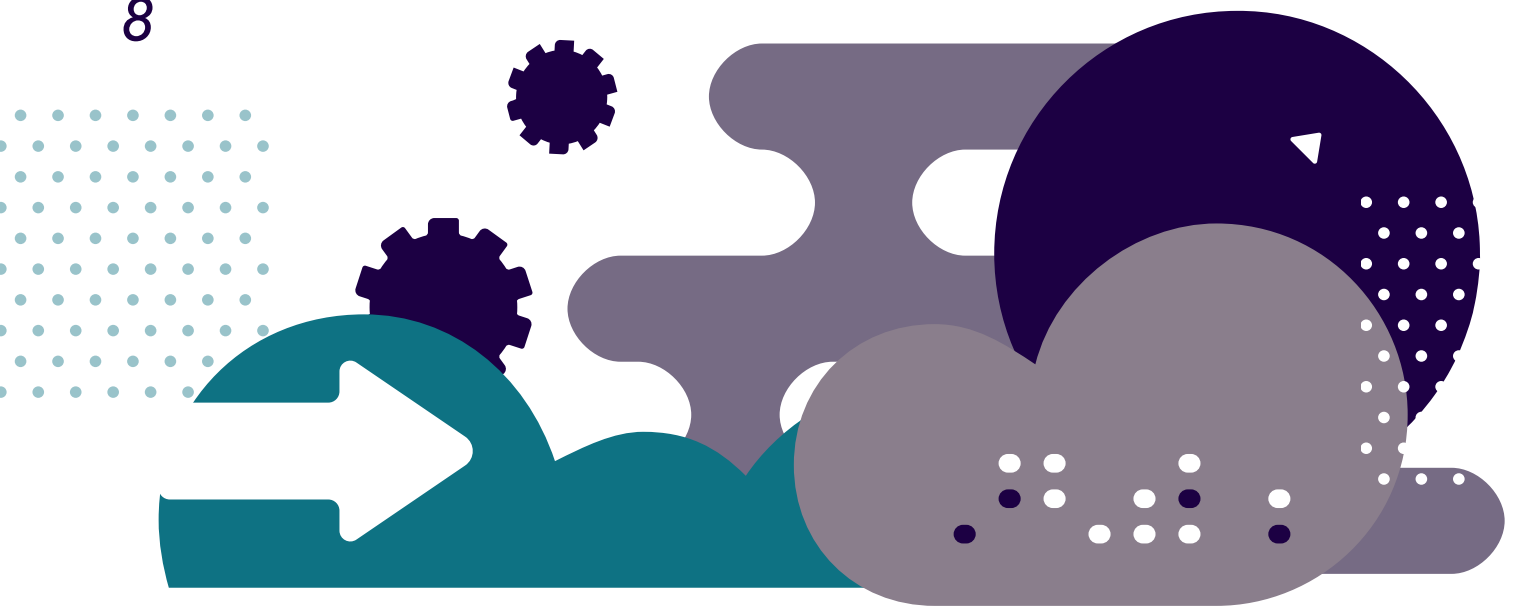
You need skills

Data scientists have been a hot property in the last few years, being expert in data modeling, statistics and data analytics, and machine learning are pushing that demand even higher. Recruitment website Indeed found that between 2013 and 2019, the number of vacancies for data scientists increased by 344%. Simply put, demand is outstripping supply, and the largest technology organizations, like

Facebook and Google, are snapping up the best talent; those in other verticals are finding it difficult to get someone with the domain knowledge to go along with the data science skillset. Even then, some organizations, such as BNY Mellon, can afford to turn down the candidates with the perfect CV if they don’t believe they have the communication skills necessary to make the job role work ([web link](#)).

“What the difficulty of obtaining data science expertise does to the market is it forces businesses to consider either building a solution themselves, which may take more time but give them more IP or deploying a point solution. The latter means they’re faster to market but could mean they’re paying a premium price and not building expertise,” Omdia’s Mark Beccue said.

At the moment, the situation lends itself to point-to-point solutions. Still, Beccue believes that over time, the democratization of data science will lead to enterprises being more comfortable with building their own tools. “We’ll start to have more data science talent but it will become a lot less important, because software and systems will become easier to use,” he said.



In a truly digital business, measurement is key

The path to digital transformation simultaneously creates more complexity, and new ways to deal with it. Business process flow monitoring is one such method – connecting the state of IT to the organization's performance and enabling decisions based on business outcomes.

"If you can get a view of your process and you can understand how it is performing, you can get ahead of the game, and you can deliver that client product at the right time and the right price," said Ian Philips, Vice President for DRYiCE iControl, a business process flow monitoring and operational intelligence product.

Joining Business with IT

DRYiCE is a division of HCL Technologies responsible for a variety of enterprise software products, from AI-based virtual assistants (DRYiCE Lucy) to network automation (DRYiCE NetBot) and data integration (DRYiCE ROAR) tools.

The parent company HCL is an IT services giant with a presence in 46 countries, nearly \$10 billion in annual revenue, and half of Fortune 500 among its customers.

DRYiCE was born eight years ago to harness the power of emerging technologies. DRYiCE iControl

was explicitly designed to focus on business process flow – a complex chain of people and systems responsible for delivering a product or a service. A simple payment in a bank, for example, might involve an assortment of payment platforms, multiple authentications, authorization, data capture and settlement stages, currency conversion, and checks against sanctions lists. Every step leaves a trail of breadcrumbs in IT infrastructure, as logs and metrics.

The belief within DRYiCE is that by understanding where precisely minute breaks and inefficiencies occur in such complex chains, organizations can improve their service levels. And with thorough monitoring, you can measure performance.

According to Ian Philips, one of the problems with mapping business processes is they are not a perfect or exact fit for auto-discovery; this is why DRYiCE performs custom work on every iControl deployment.

"You really need to understand the process that you're going to tackle," he said. "And if you can understand that



process, you can measure it. You can identify the barriers, which will allow you to focus where your spending is going to be, and therefore you are going to get the ROI that you are looking to achieve for your business.”

Another attractive property of business processes is they are relatively resistant to change: “Technology might change, but the business processes are pretty constant within your organization. If you’ve got a good handle on them, as your technology changes, you can relate it back to the steps that will be affected and understand what the ripple effect will be.”

In control

iControl can be deployed to provide “cohesive, real-time, end-to-end visibility across your business and IT,” Ian Philips said. “It really lets you get ahead of the game, in terms of troubleshooting and re-mediating, so that you can actually call the client before they call you.”

The software brings together data collected by IT monitoring tools, analyzes it, and presents it in a way

that makes it easy to understand, so that even non-technical users will be able to perform business process mapping and create target definitions.

It features 170+ industry-standard business processes across multiple sectors like Financial, Healthcare, Life Sciences, Energy & Utilities and Consumer Packaged Goods, in which many DRYiCE customers operate, for processes like Treasury payments and receivables, equities trade confirmations, and anti-financial crime measures. iControl also offers 300+ reusable business KPIs or targets to measure the business process performance. And of course, it allows customers to run predictive analytics on some of the metrics.

“iControl is designed to join your process with your underlying data, so you can go up and down the stack; if a client has a problem, you can drill all the way down to understand which business process, which service, which application server, all the way to infrastructure KPIs,” Ian Philips said.

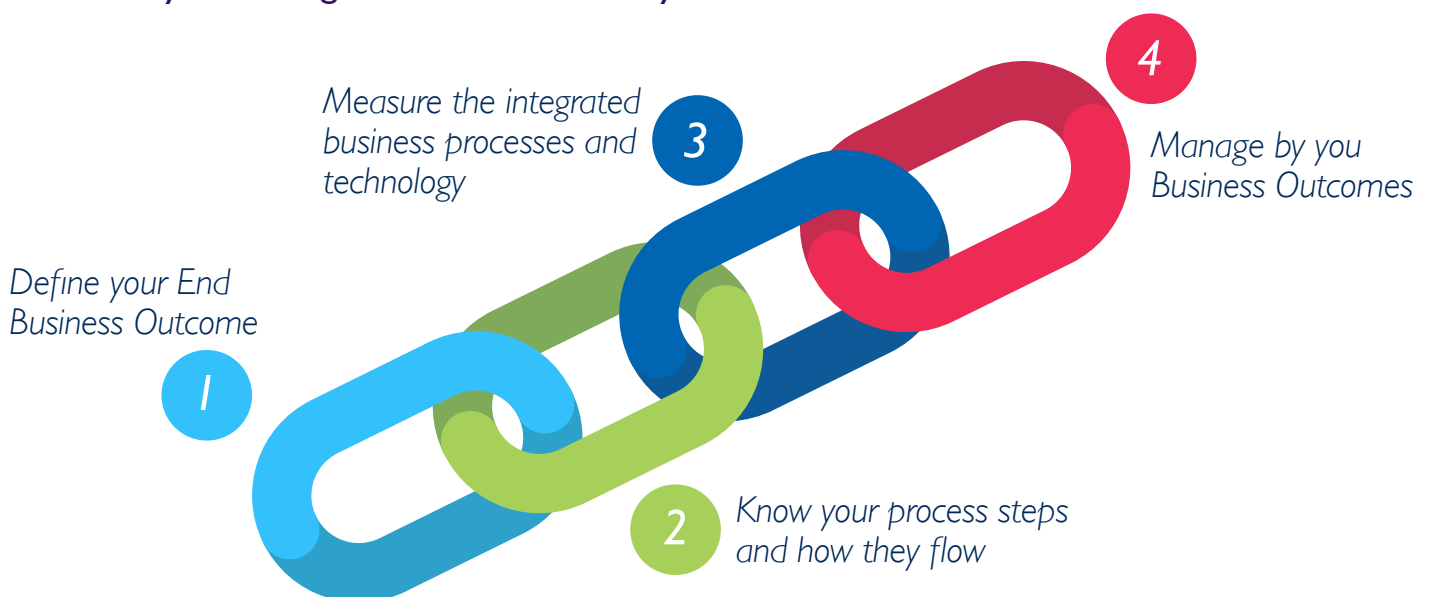
“You know, IT has been doing this for a long time, but only focusing on the

bottom piece – we need to extend that up now, so that you can give yourself that data-driven analytics that helps understand problems, and go from reactive to proactive.”

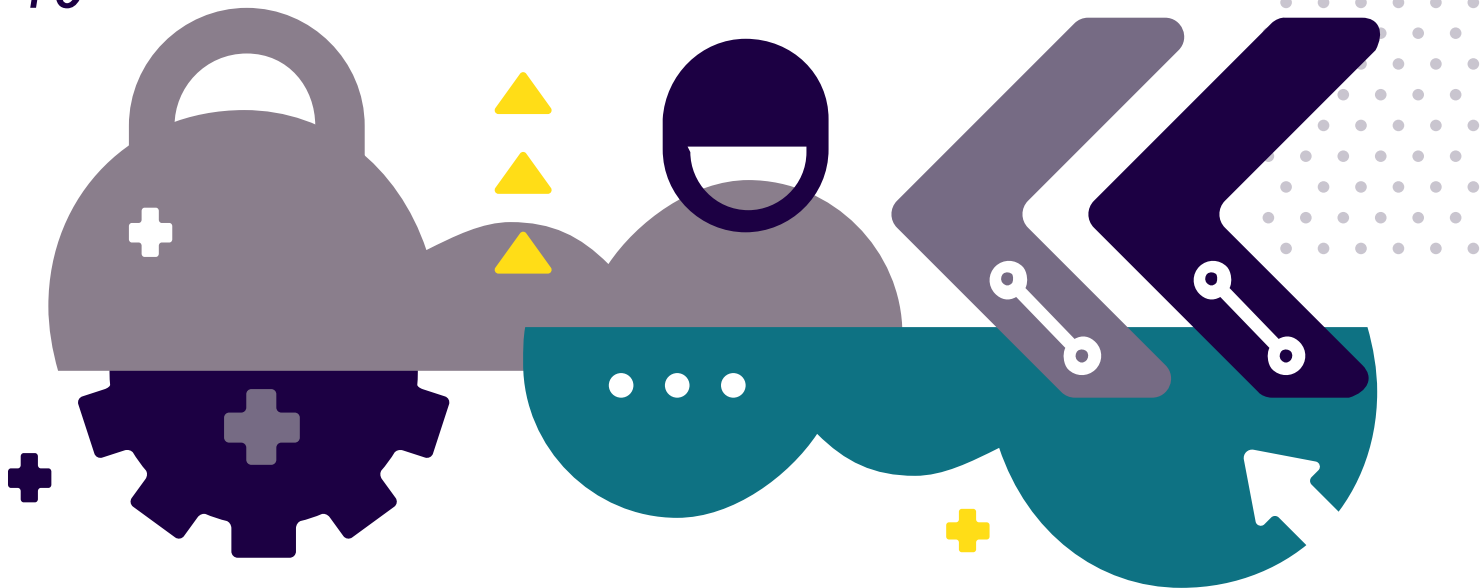
Most importantly, iControl translates the language of IT into phrases that will be understood in the boardroom: “The questions that you need to be asking yourself when something goes wrong, i.e. when one of those metrics is flagging up for you, are: who’s affected, what’s affected, and how much? If you know the answers to those questions, will be able to make the right decisions for your company. Being able to get down to that level of detail quickly is what really counts.”

Using iControl’s patented approach to understanding which specific factors govern the performance of business processes can bring many potential benefits: improved service performance, more deadlines met, higher customer satisfaction, easier regulatory compliance, and could even enable some organizations to expand their repertoire – by offering a premium service for clients interested in more aggressive SLAs, for example.

How do you manage End to End across your Business Process



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The proof is in the pudding



Today approximately 70 to 80% of end-to-end business processes are executed by applications, while the remaining are executed by manual processing, through human intervention – whether that is to add items into the flow, clear blockages, or send items outside of the organization. Despite all the advances in technology and business, organizations still use the traditional point monitoring approach across layers. But this leads to critical process interruptions that impact customers and their ability to do business.

There are a number of organizations already benefiting from implementing products that incorporate AI into their business process flow monitoring. Here, we have taken a look at one such example.

Optimization at scale

A financial services firm – which we unfortunately cannot name – with more than \$45 billion in revenue, a presence in over 50 countries and a global workforce of more than 100,000 employees had received more than two billion technical alerts daily. The sheer volume made it difficult to derive business insights from the alerts and generate value for the organization. In addition, the presence of disparate IT monitoring tools and business intelligence systems made it difficult to provide a unified view of the digital landscape.

A lack of adequate reporting and application monitoring systems made it difficult for the organization to keep up with established service level agreements (SLAs). It was missing service improvement reporting and customizable visualizations in operational and technical areas.

DRYiCE iControl was deployed to sort and analyze business data, so that



it could help with decision making. This enabled the management to have greater control over the business and enhanced its workforce overall efficiency. The solution helped bring together 'off-the-shelf' business intelligence systems and the underlying data to give them a business context.

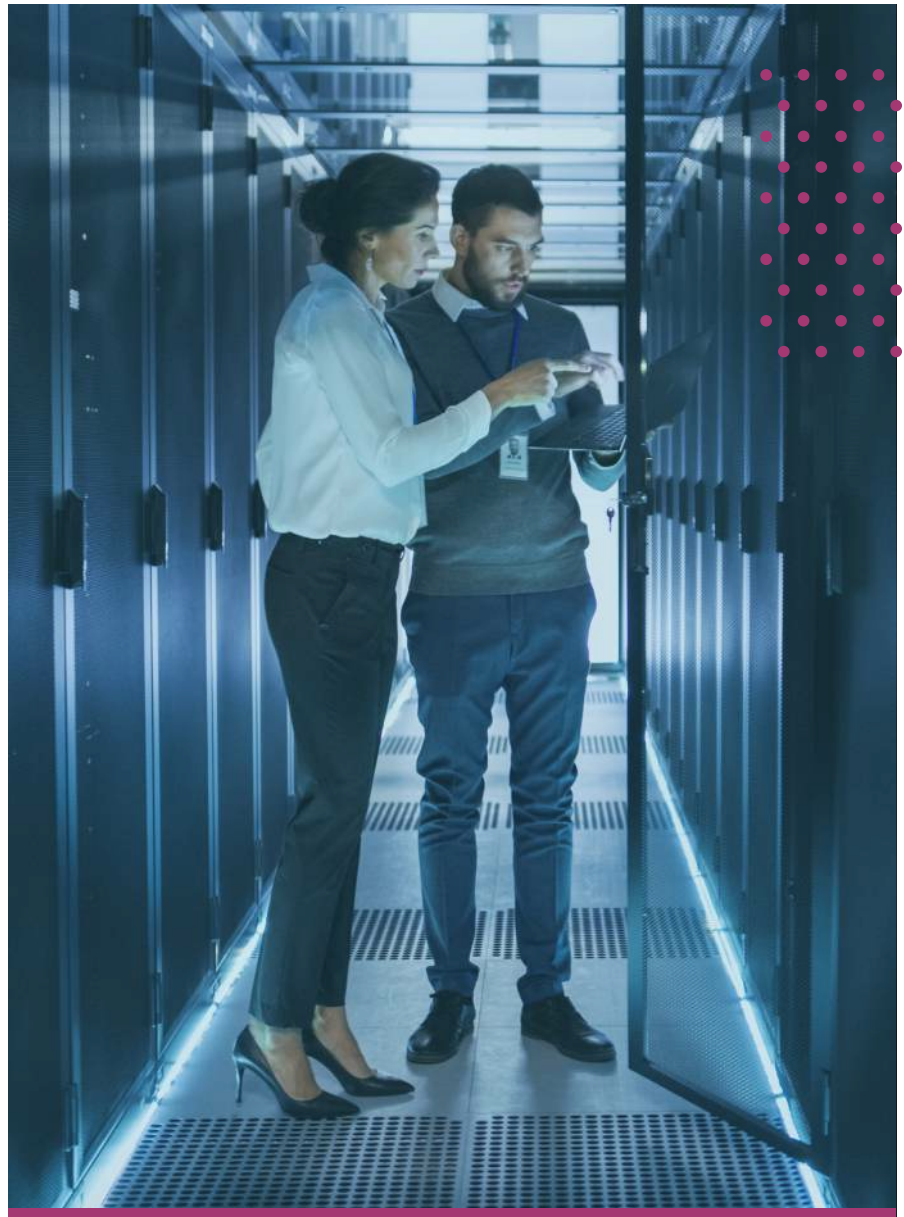
In addition, DRYiCE iControl measured the business impact, criticality of incidents, and determining deadlines for corrective action. Proactive application monitoring and management were also enabled, leading to improved end-to-end system visibility. The financial services firm was able to implement data visualizations across technical and operational areas, which allowed business and infrastructure impact analysis to be carried out and reported.

So far, the impact of the solution has been staggering – with a 60 to 70% reduction in service-level outages across some of the flows, a 20% decrease in escalations, and an improved alignment of IT and business objectives.

So how does it actually work?

First, using the iControl DRYiCE domain packs, the experts can quickly document a business process by identifying all the people, IT, and complex steps that make up the critical sequences of events within it. Second, they build on top of an existing IT operations monitoring platform by mapping the business process layer to the underlying operational data, thereby bringing previously siloed domains together in a single view. This provides a comprehensive real-time view of business processes, which was not possible before. By building this bridge, the organization gets end-to-end visibility into bottlenecks, brownouts, correlations, and certain IT events' impact on business performance.

Using the out of box available machine learning algorithms across the data,



iControl can identify early warnings that require special attention or investment, minimizing cost and risk, and improving management. Since this is all done in real-time, businesses can respond quicker and more appropriately to failures, providing the necessary time needed to get a client order or payment back into the STP flow, keeping the board and regulators happy.

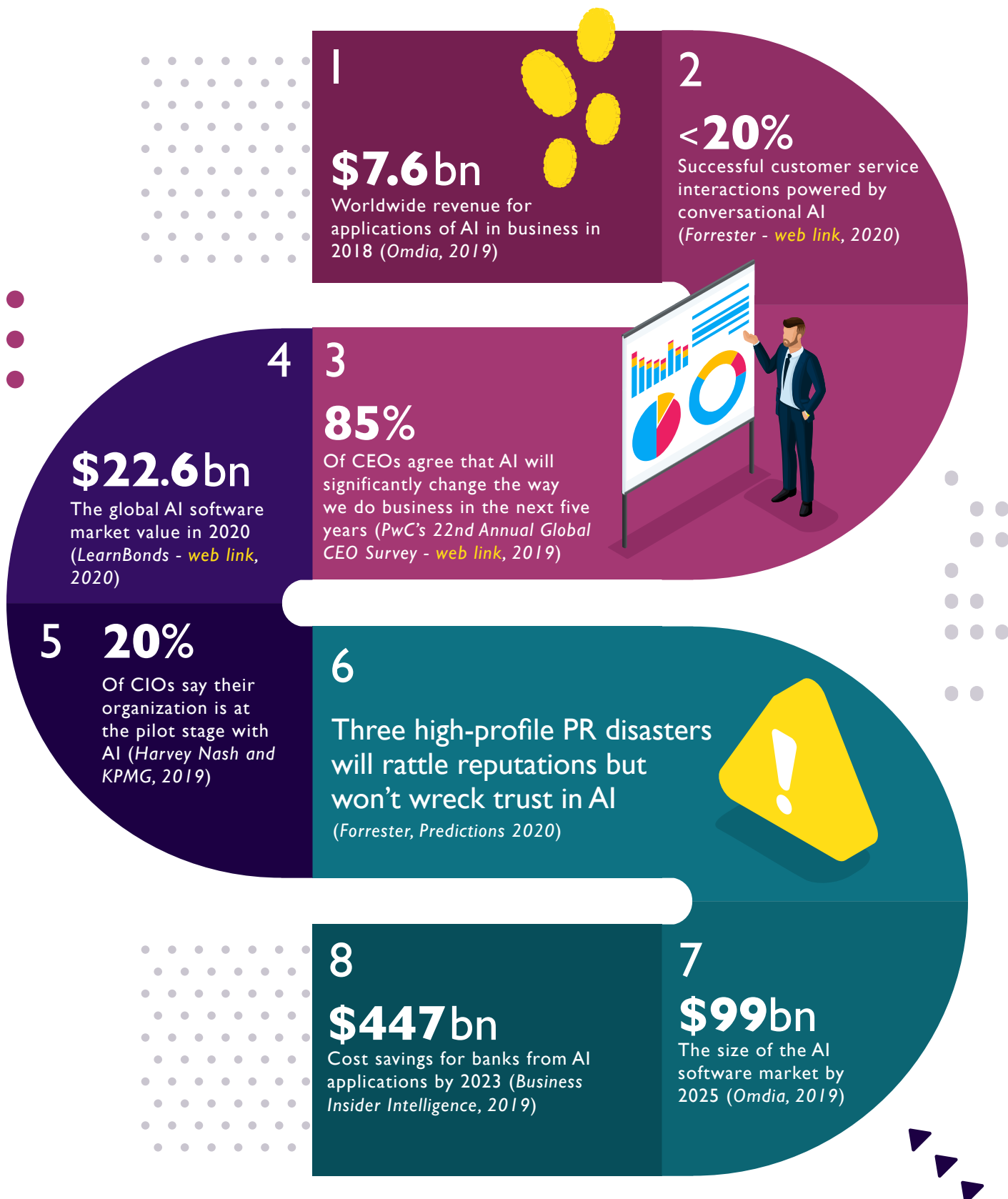
What does this mean in terms of ROI?

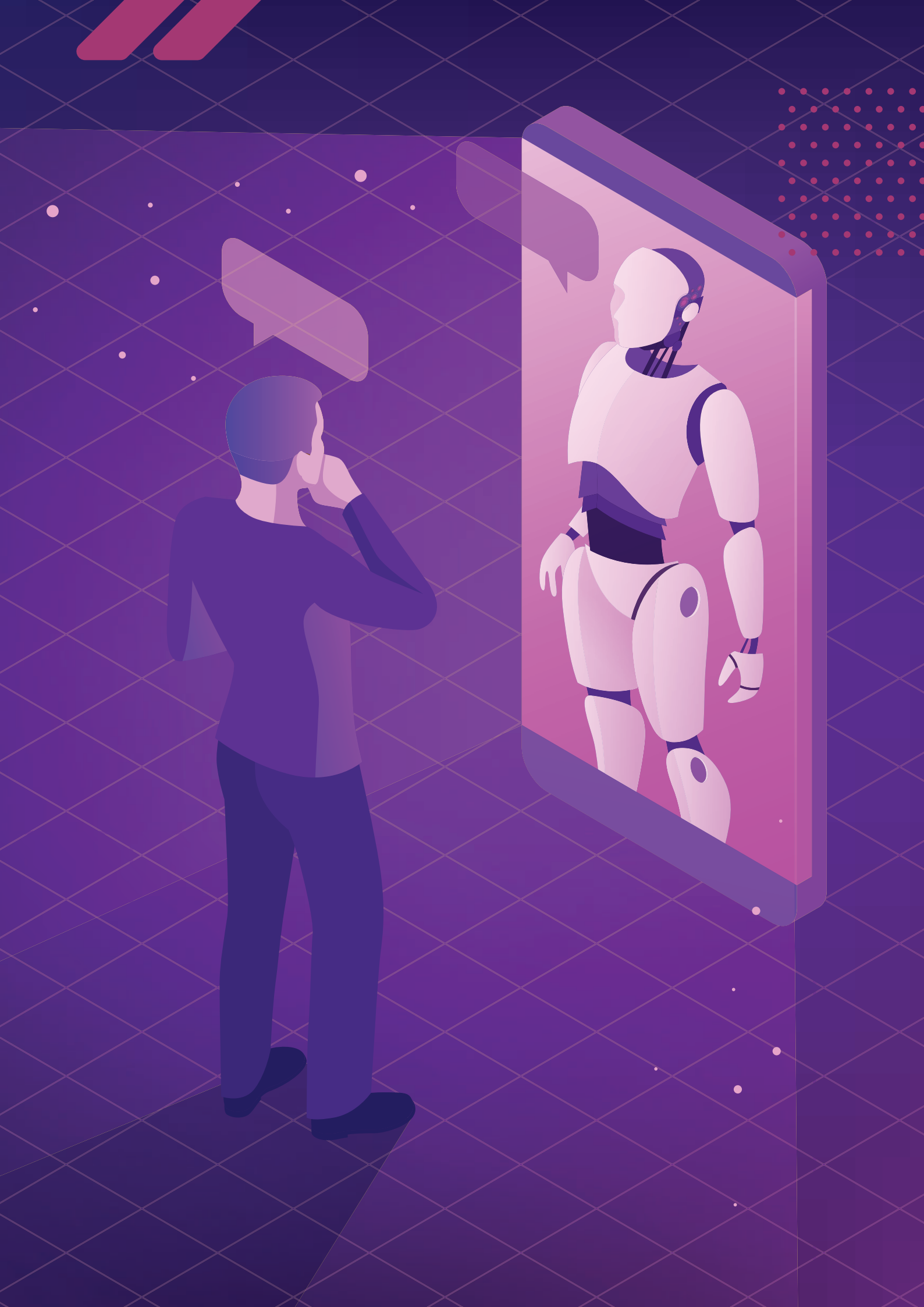
"Firstly, you don't have staff sitting around idle, not doing anything because

they're waiting for things to go wrong – the system will tell you how many people you need at work and at what time, so you can reduce your staffing, based on the volumes that are coming through and system performance," explained Shakir Ladak, Chief Architect for DRYiCE iControl.

The second significant benefit is organizations will be able to avoid missed deadlines, resulting in fewer fines and interest penalties. Also, if the level of the service provided is right, you will have more potential to bring in business from other places.

Through hardships to the stars







AI and finance

“AI is often just a lot about buzzwords and it confuses people and organizations need to be able to understand how it can actually affect their business”

While the finance sector is often accused of being behind the curve when it comes to technology and digital transformation, it has embraced AI in a number of key areas, ahead of other industry verticals. Banking and insurance companies have always relied on data and timely decision-making; more importantly, they had to have data quality and governance policies in place, making these types of businesses ripe for AI disruption.

As is often the case, once a few financial institutions take the plunge with new technologies and processes, others follow, as long as they can see proven results. Those that lag behind may see their clients switching to more agile competitors.

But unlike the technology cycles that came before, the shift to AI has been accelerated as a result of new pressures from FinTech firms. The term refers to start-ups attempting to disrupt the financial sector by providing services with the level of customer experience expected of popular online brands like Google and Amazon. Financial institutions are now either acquiring FinTechs, buying their services, or aiming to emulate their solutions by partnering with IT service providers that have more experience in this field. For instance, financial giant BNY Mellon works alongside 150 different FinTech organizations ([web link](#)); majority of these are partnerships, but in some cases, the bank will invest in one of the companies. In addition, there has been a number of so-called challenger banks appearing in the last decade.



“If you look at the financial sector, there is a lot of disruption going on with new banks that have leaner operations, threatening the larger players – in addition, there is a lot of risk regulation coming in that’s soaking up the capital, so I don’t think enough is going on with the AI budget to give it a push,” commented Shakir Ladak, Chief Architect for DRYiCE iControl.

In some instances, traditional banks with vast resources are developing their own AI platforms; for example, JP Morgan Chase created OmniAI to help ingest relevant data into their machine learning models at speed ([web link](#)). This has enabled the bank to improve in some of its key focus areas, helping personalize consumer banking services and drive efficiencies in expense management. Besides applications in customer service and process optimization, the company wants to use AI to target customers that might not have a bank account at all – according to a World Bank report ([web link](#)), 1.7 billion adults worldwide are under-banked. Credit scoring provided by AI can take into consideration more variables and give a better indication of which applications are high-risk, and which customers are credit-worthy but have a lack of credit history to back this up.

There are numerous other examples of AI being used in the financial services sector; the Financial Conduct Authority (FCA) has adopted machine learning to help individuals manage their current accounts, Fukoku Mutual Life Insurance is using IBM's Watson Explorer AI to calculate pay-outs, and nearly all banks are employing some form of machine learning to help detect fraudulent transactions. The idea is simple: if you have enough data on an individual's spending habits and location, machine learning models can identify any anomalies in transactions. The bank can then take steps to verify whether this is a fraudulent transaction or a genuine one-off purchase.

"In the US alone, that type of fraud is worth \$18 billion a year, and therefore it makes sense for financial services to tackle that issue," commented Omdia's Mark Beccue.

AI-based chatbots represent another facet of AI, which has been popular among financial services firms. Capital One's chatbot called Eno comes equipped with fraud and transaction alerts and 'free trial' subscription monitoring, while Bank of America's voice-activated virtual assistant Erica can call up credit score information, search



for past transactions, and understand a vast range of questions. Recent additions to the chatbot include alerts when a refund is posted to a customer's account, and the ability to track how far they are from their next rewards program tier. Erica has 10 million users already ([web link](#)), and has completed about 100 million client requests since being launched in June 2018.

These chatbots are used to improve the customer-experience while reducing the workload of actual customer service employees – the ultimate aim is to provide self-service banking capabilities alongside personalized notifications and prompts, making customers feel in charge of their finances. In 2017, Juniper Research ([web link](#)) forecast that banks would save \$8 billion a year by just deploying chatbots, even without considering other uses of AI. The prediction was made before many of the additional features of chatbots emerged, so today, the savings are likely to be higher.

AI-based tools are gaining popularity in other areas of financial services, like insurance and trading. In the former, AI is being used to make better underwriting decisions. McKinsey estimates ([web link](#)) that this could be worth up to \$1.1 trillion per year

if the technology is applied across the industry. Machine learning could be used to price insurance policies more competitively while also helping recommend the right product to the right customer. Neural networks can be trained to detect fraudulent claims. At the same time chatbots can do what they've done for the banks – helping answer queries more effectively and freeing up employees for more valuable activities within the business.

AI is playing an increasingly important part in the operation of the world's stock markets. According to investor service Seeking Alpha ([web link](#)), by the start of 2019, 80 percent of the daily moves in US stocks were machine-led. With data-driven investments rising steadily, models that can use more data from a variety of sources, including unstructured data gathered from social media, and process it swiftly, can help make better decisions, which means more profitable transactions.

Ian Philips, VP Business Development for DRYICE iControl, noted that while machine learning was widely used in trading, functions such as audited cash and payments applications were still very much in their infancy. "Everybody's still doing it with part-historical data – there's very little machine learning taking place," he said.

There's a nervousness around humanity losing control

The discussions around implementing AI are far more complicated than merely creating, or choosing, a product or service; there are ethical considerations too.

"It's all wrapped up in the notion of machines starting to make decisions that affect our lives and a nervousness around humanity losing control over that," Tim Ensor, director of Artificial Intelligence at Cambridge Consultants, told AI Business.

This means there are questions around whether it is acceptable for vehicles to make decisions about what happens in a car crash scenario, how to deal with the concept of mass surveillance, and what advances in technology could mean for weapons systems with autonomous capabilities.

"The question businesses have to be asking is: what are the potential bad outcomes that might happen as a

result of using AI to make decisions for ourselves or our customers," Ensor said.

For instance, an algorithm used to approve or decline loan applications directly impacts on people's lives. If an application of AI can have this kind of impact, there needs to be a high level of oversight.

"You need to be cognizant and conscious of the potential outcomes of AI. There will be some applications

where it doesn't matter if AI does get things wrong, but if it does have potential negative outcomes, it requires greater scrutiny," he added.

Engineering: just as important, not as talked about

The other area of ethical concern is on the engineering side – around developing new AI products and bringing them to market. "It means asking if you're building new products, including levels of intelligence and autonomy, whether that product is safe for use on the population," Ensor said.

These are particularly pertinent questions for the automotive and medical industries. "Both of those sectors have a huge amount of experience dealing with similar issues. They're both trying to slightly readjust to a world where we're expecting greater levels of autonomy in the products and machines we use," Ensor explained.

Engineers working on AI products must demonstrate that their models can perform adequately in a wide variety of settings. Besides, they must ensure they've carefully documented



their design process, and then consider how to show a level of good practice in their approach to delivering AI systems.

What about the law

Some of the world's biggest technology companies are now providing services such as facial recognition, which are being used by private and public sector organizations in different ways.

"It's an age-old problem that we build tools that can achieve many different things, and humans will use them for good purposes, and maybe some questionable purposes," Ensor said.

Legislation is slow to catch-up with technological advances. This leaves the door open for various legal interpretations; at the same time, many companies providing AI-based tools believe it is up to their customers – whether business or government – to decide whether to use the technology ethically.

While Ensor sympathizes with this perspective, he believes there should be a degree of use case policing from vendors. "There is some onus on technology providers to keep a watch on what people are doing with their tools, even if it might be unreasonable to criticize them for every use case."

How about AI for business flow monitoring?

Ensor believes it is essential for businesses to consider the ethical implications of AI, even for some of the more mundane uses. "For example, think of online invoice processing: if at any point that system determines it is not going to pay invoices, and that causes suppliers to get into financial difficulties, then you need to be able to know that and understand why," he said.

Considering this, questions of ethics in artificial intelligence often relate back to engineering, rather than some abstract philosophical musings.



It's an age-old problem that we build tools that can achieve many different things, and humans will use them for good purposes, and maybe some questionable purposes.

"It's not as much around 'should we be allowing AI to make this decision for us?' It's much more around 'can we build a tool that does what it's supposed to do?' Practical AI is about building these systems to do what they're supposed to do, and if they fail, it's very important that we have a way of remedying whatever that failure might be," he said.

This could apply to things like CV screenings for job applications in HR, or loan approvals – there have to be fallback mechanisms in place.

Data bias

Unintentional bias within datasets is a significant part of the debate around the ethical uses of AI. Ensor believes

that it's yet another question that needs to be considered within the context of engineering. "If we as (a) society believe that the use of AI is valid, then the question about data bias is a secondary question," he said.

"So we may determine that mass surveillance using AI is not a good idea, but if we thought it was acceptable, then getting it to work properly using a decent sample and set of training data is a very secondary ethical question. It comes down to a risk-based approach to ensure any AI you're using does what it's supposed to do."

If a business is relying on a third-party AI system, it needs to make sure that it was based on data of appropriate quality.

Through the looking glass

“Humans will focus on the tasks that AI can’t keep up with. These include innovation and creativity, the ability to join disparate subjects, and to think in constructs like similes and metaphors, all of which prove too hard for existing AI models.”

The COVID-19 pandemic brings an end to the industrial age, and begins a new digital age, comprising of three phases of artificial intelligence that will change the world as we know it. That is the view of Ade McCormack, a renowned futurist, and author who regularly focuses on the CIO agenda.

According to McCormack, the first phase is where we are right now; the industrial era organizations are using new technologies, including AI, IoT, and blockchain, to change their existing business processes.

The next phase, McCormack says, is where we embrace human cognition – so instead of replacing people with technology, the model becomes “technology plus people.” This period could last for the next decade.

“This phase is where people are bringing their cognitive capacity to bear, and using their brains in ways that their brains are designed for,” he explained. Humans will focus on the tasks that AI can’t keep up with. These include innovation and creativity, the

ability to join disparate subjects, and to think in constructs like similes and metaphors, all of which prove too hard for existing AI models.

The third phase of AI, starting in 10-15 years, will see the technology becoming increasingly capable of performing these human functions. This is an area McCormack believes governments and businesses need to start thinking about, as they’ll pass as much work as they can over to AI systems, and they will have to get more out of their humans.

How this could play out

“The reality is that the potential of AI is nowhere near understood yet,” McCormack said, adding that there was still much to do in the development of the technology, particularly in neuroscience.

“Today AI or machine learning does a great job with back-office processing – there’s a lot of stuff that AI can do very well, better than a human – and it has the potential to obviate the need for certain jobs like surgeons, architects, auditors, and tax advisers, and that’s





what organizations like EY and PwC need to bear that in mind and adapt accordingly now.”

The current weakness in AI, he said, is in the front-end, where organizations often choose to deploy AI-based chatbots. These services can be clunky and don’t replicate human-to-human interaction well enough just yet.

McCormack predicts that when AI eventually becomes the norm, our children and grandchildren will marvel at the fact that back in the early 21st century, humans were allowed to do drive cars or perform surgeries, because AI systems will be able to do it much faster, safer and with more precision.

Of course, unlike humans, AI-based systems don’t have hangovers and can’t be distracted. But there will still be a lag before robotic systems – the physical extension of AI systems – get up to speed with complex tasks.

“Hospitals of the near-future will have algorithms making medical decisions,

After extreme optimization, you’re in a situation where we don’t really need humans to work in order to keep the economies ticking over.

and humans helping older people to get out of baths because robots aren’t yet that sophisticated. So in terms of physical activities, robots can lift heavy things and put them down precisely, but they can’t deal with complicated systems like carrying humans,” he said.

Changing the pattern of human life

Existing supply chains around the world are rife with inefficiencies: for example, ships and trucks are not synchronized to meet at the port at the same time. AI systems can help take care of such decisions, so McCormack envisions a long phase of optimization.

“After extreme optimization, you’re in a situation where we don’t really need humans to work in order to keep the economies ticking over,” he said.

So what would this mean for humans? There are three potential scenarios of

how this could play out, and the first is a situation in which humans are not required to do anything; instead, life will be focused on the consumption of food and media.

The second scenario is where new technologies are used to augment humans – both through the gadgets that humans use, and inside their bodies. “That’s a scenario where we become god-like,” McCormack said.

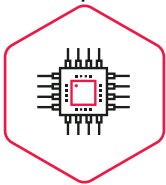
The third and final scenario is where humans revert to their original nature, there’s a backlash against AI technologies, and a reversal to a kind of pre-industrial lifestyle, in which people rediscover how to use their senses in a more nuanced way. “Any of these three would be possible because AI would enable us; in part, because we’d have a lot more time on our hands,” McCormack said.



About DRYiCE Software

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