AI: An opportunity amidst a crisis

December 2020
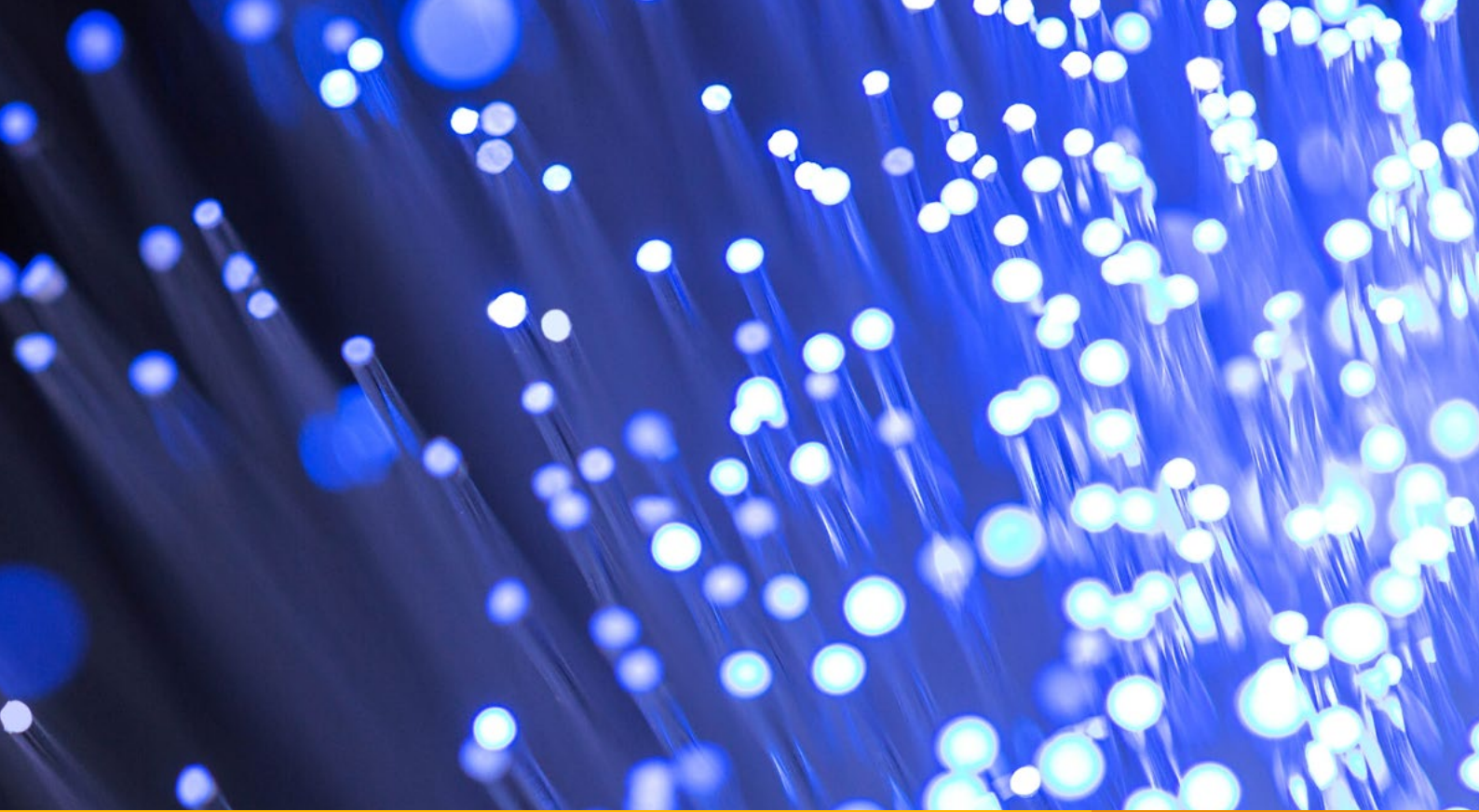
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Foreword

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As the COVID-19 pandemic continues to evolve, there has never been a more pressing need for organisations to rethink and reconfigure their businesses for a changed world. Many organisations are already making changes in the way they run their businesses and the way they take decisions to emerge stronger. In the current scenario, AI is being seen as a key enabler for organisations to repair (emerge from the present crisis), rethink (plan for transformation) and reconfigure (make fundamental changes to the operating model for lasting competitive advantage).

PwC undertook a very extensive global and India-specific survey of CXOs and decision makers across a number of diverse sectors to understand the trends and share insights around the adoption, benefits and risks of AI, with a focus on the COVID-19 world. Our survey reveals that the rate of AI adoption has increased from 62%[1] to 70%. Further, the nature of challenges related to adoption has changed from purely technical to business-related factors. We believe that this trend is likely to continue in the future.

The report also provides a sector- and function-level analysis of AI adoption trends. One of the interesting insights uncovered by our survey is that sectors which are facing heavy disruption, such as travel and hospitality, are also the biggest proponents and users of AI. Given the demand uncertainty in many sectors, we see a renewed focus on AI to enable front office transformation in terms of better customer experience, more accurate segmentation and targeting, as well as empowerment of sales teams.

Despite its promise, implementing and scaling up AI poses its own set of challenges. We have touched upon some of these challenges and also provided an approach that can help organisations get the maximum value from their AI initiatives.

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1   https://www.pwc.in/assets/pdfs/consulting/technology/data-and-analytics/with-ai-s-great-power-comes-great-responsibility.pdf

Foreword

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COVID-19 has accelerated the adoption of advanced analytics and AI around the world. With most countries, companies and consumers going digital, the need for AI-enabled applications for facial recognition, contact tracing, diagnosis and other areas has increased. Our global and India surveys reveal that companies that had invested in AI before COVID-19 were generally better able to deal with the challenges and, as a result, they have increased their investment in AI since the pandemic. Unfortunately, companies that failed to go digital and adopt AI before the pandemic have struggled to survive and not been able to invest in AI. This has resulted in further polarisation of companies.

In India, companies have accelerated their innovations and investments in AI during the pandemic. If this trend continues over the next couple of years, India will be well positioned to be a global powerhouse in AI. This requires India to not just follow what other countries are doing with respect to AI but also take a unique Indian approach to AI. Given the abundance of human labour and skills, India should focus more on augmenting human decision making and not just automating tasks that replace human labour. The latter could result in a significant cost to society while only marginally reducing the costs for corporates.

The crisis has presented India with a unique opportunity to innovate, address some of the key challenges related to AI adoption and use AI in a responsible manner.

Introduction

The far-reaching consequences of the global COVID-19 pandemic – have driven organisations to balance the competing priorities of safeguarding health and ensuring business continuity. As they continue to navigate the uncertainties, organisations have started realising the potential of cutting-edge digital and cognitive tools and technologies to manage the crisis.

AI[2] has the potential to empower firms to develop digitally enabled products and services and serve untapped markets. Not only does AI open up unexplored opportunities for organisations but it also allows them to redefine their current operating model.

USD 15.7 trillion – that's the global economic value addition that AI can provide by 2030.[3] Our research also shows that adoption of AI could result in a boost of up to 26% for some local economies. However, to get the best out of AI, businesses need to start viewing it as a necessity rather than a luxury. AI needs to be woven into the fabric of the enterprise. In doing so, businesses need to recognise that in developing countries like India, improving demand may be a potentially more relevant benefit than savings through automation. Hence, given the availability of a large pool of skilled resources, AI efforts need to be directed towards assisting humans to prepare businesses for the future.

As we emerge from the current crisis, the survey findings show that optimism with regard to AI has gone up significantly from 72% to 92%, and the rate of AI adoption has increased from 62%[4] to 70%. Further, 94% of the respondents claim they have either implemented or are planning to implement AI in their organisations. This is a marked increase given that in 2019, this percentage stood at 62%.[5]

As organisations repair, rethink and reconfigure their businesses, there is an increased expectation that AI will help achieve greater value, create competitive advantage and augment decision-making capabilities in a way that will help them reinvent the future.

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2   For the purpose of this report, artificial intelligence is defined as a collection of technologies which are capable of sensing, thinking and acting like rational human beings. In recent years, every individual, organisation and government has seen numerous instances of AI enter various facets of their lives – the most common applications being chatbots, facial recognition, image classification, aggregators, recommendation engines and targeted marketing. AI has the potential to solve complex problems effectively at scale.

3   https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

4   https://www.pwc.com/gx/en/ceo-survey/2019/report/pwc-22nd-annual-global-ceo-survey.pdf

5   https://www.pwc.in/assets/pdfs/consulting/technology/data-and-analytics/with-ai-s-great-power-comes-great-responsibility.pdf

Objectives and methodology

To gain a sense of the AI adoption landscape in India, PwC conducted comprehensive interviews between August and September 2020, eliciting more than 200 responses from CXOs and decision makers across the Indian market. Around the same time (September–October 2020), PwC conducted a larger online global survey that attracted 670 responses from businesses across the world.[6]

The primary objective of the India-based study was to understand the awareness, adoption and impact of AI in the post COVID-19 landscape. It also sought to capture the near- and long-term benefits of AI adoption. On the other hand, the global survey aimed to understand the importance of ethics in AI, including the development, deployment and ongoing management of AI solutions and the extent to which COVID-19 impacted AI adoption.

The survey covered respondents from:

- Industries such as financial services, healthcare and pharma, industrial products, retail and consumer, telecom, media and technology, and travel and hospitality; and

- Business functions such as customer service, finance and tax, human resources, IT and cyber security, manufacturing and operations, research and development, risk, legal and compliance, sales and marketing, supply chain and logistics.
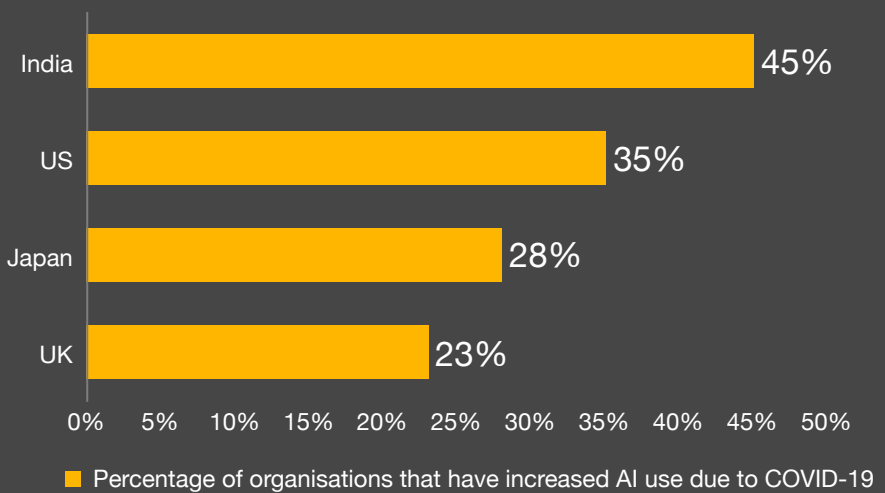
6   PwC's Responsible AI Survey 2020
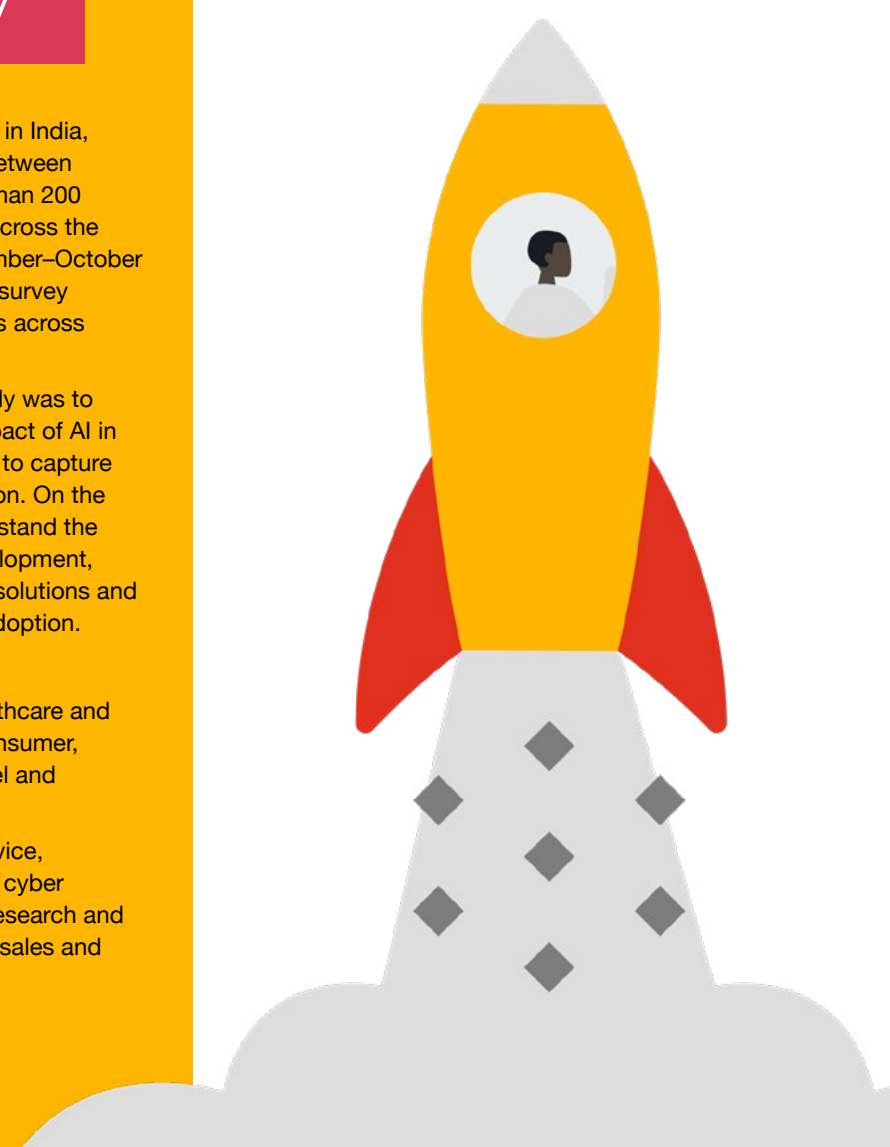
AI and COVID-19: An overview

Impact of COVID-19

Amidst the global pandemic, India has noted the highest increase in the use of AI as compared to major economies (the US, UK and Japan). Indian organisations are firm in their resolve to combat the challenges of the pandemic, with the manufacturing sector reconfiguring traditional practices to automate value chain processes and the Government engaging with technology firms to solve problems in the new normal (e.g. contact tracing, contactless thermal screening). Similarly, universities, start-ups and the healthcare sector have developed AI-powered diagnostic guidance systems to help patients[7] and models to predict the spread of the virus.[8]

Increase in AI adoption in India and leading economies

Country	Percentage
India	45%
US	35%
Japan	28%
UK	23%

0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50%

■ Percentage of organisations that have increased AI use due to COVID-19

Source: PwC analysis

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7   https://analyticsindiamag.com/11-startups-in-india-using-ai-and-robotics-to-fight-covid-19/
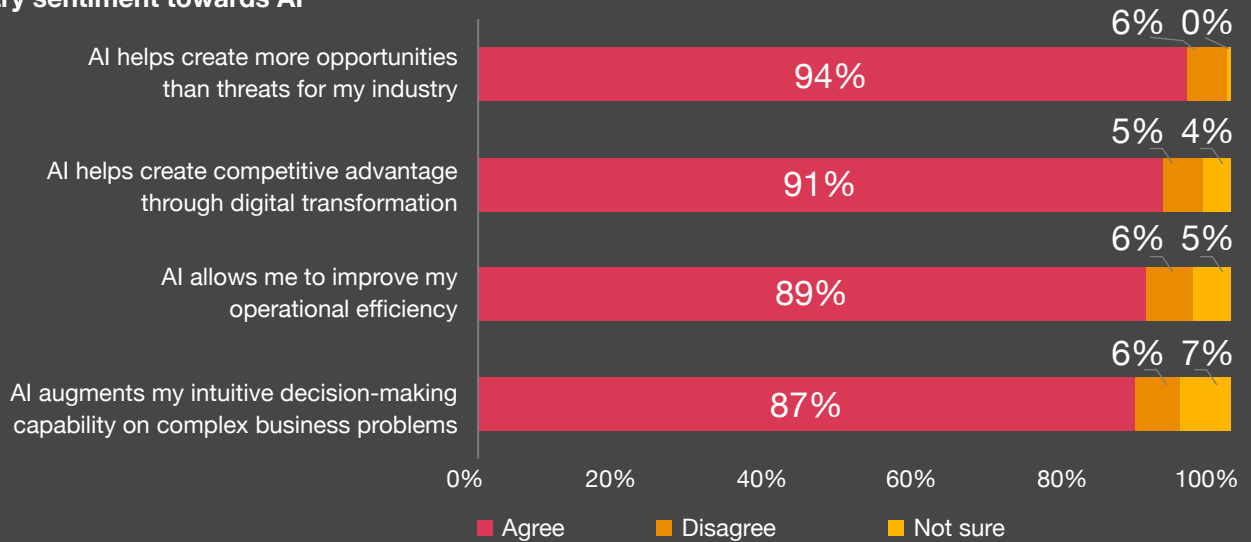
8   https://www.theweek.in/news/sci-tech/2020/07/31/how-india-is-using-artificial-intelligence-to-combat-covid-19.html

Sentiment towards AI

The **current crisis has boosted awareness of AI in many organisations**. As per our survey, 94% of organisations now believe that AI will help create more opportunities than be a threat to their industry. Enterprises are now more aware than earlier that AI is no longer a 'nice to have' technology but a 'must have'.

Industry sentiment towards AI

	Agree	Disagree	Not sure
AI helps create more opportunities than threats for my industry	94%	6%	0%
AI helps create competitive advantage through digital transformation	91%	5%	4%
AI allows me to improve my operational efficiency	89%	6%	5%
AI augments my intuitive decision-making capability on complex business problems	87%	6%	7%

0%   20%   40%   60%   80%   100%

■ Agree   ■ Disagree   ■ Not sure

Source: PwC analysis

AI is going to be a key strategic differentiator as enterprises cited creating competitive advantage through digital transformation (91%), improving operational efficiency (~90%) and augmenting decision-making capabilities (87%) as their top priorities for AI adoption. AI is helping businesses to achieve their business goals through critical digital solutions and to improve business processes through optimal resource allocation and utilisation.

Adoption trends

Adoption of AI in an organisation follows a life cycle – identifying the areas where the technology can be implemented, developing and testing pilots, implementing AI in some business areas and then finally scaling up the implementation enterprise wide. While Indian businesses still lag behind their global counterparts when it comes to scaling up AI across the organisation (5% in India vs 25% globally), India has a much higher proportion of firms (46%) with implementation in some business functions compared to the global average (28%). Significantly, more Indian enterprises are considering the use of AI (24%) compared to the global average (15%), which indicates rapid acceleration in the adoption of AI in India post the COVID-19 pandemic.

We have seen increased adoption of AI during the COVID-19 crisis as organisations attempt to repair, rethink and reconfigure their businesses. Our survey suggests that around 70% of enterprises have implemented AI in some form in one or more functional areas compared to around 62% last year.

AI adoption trends
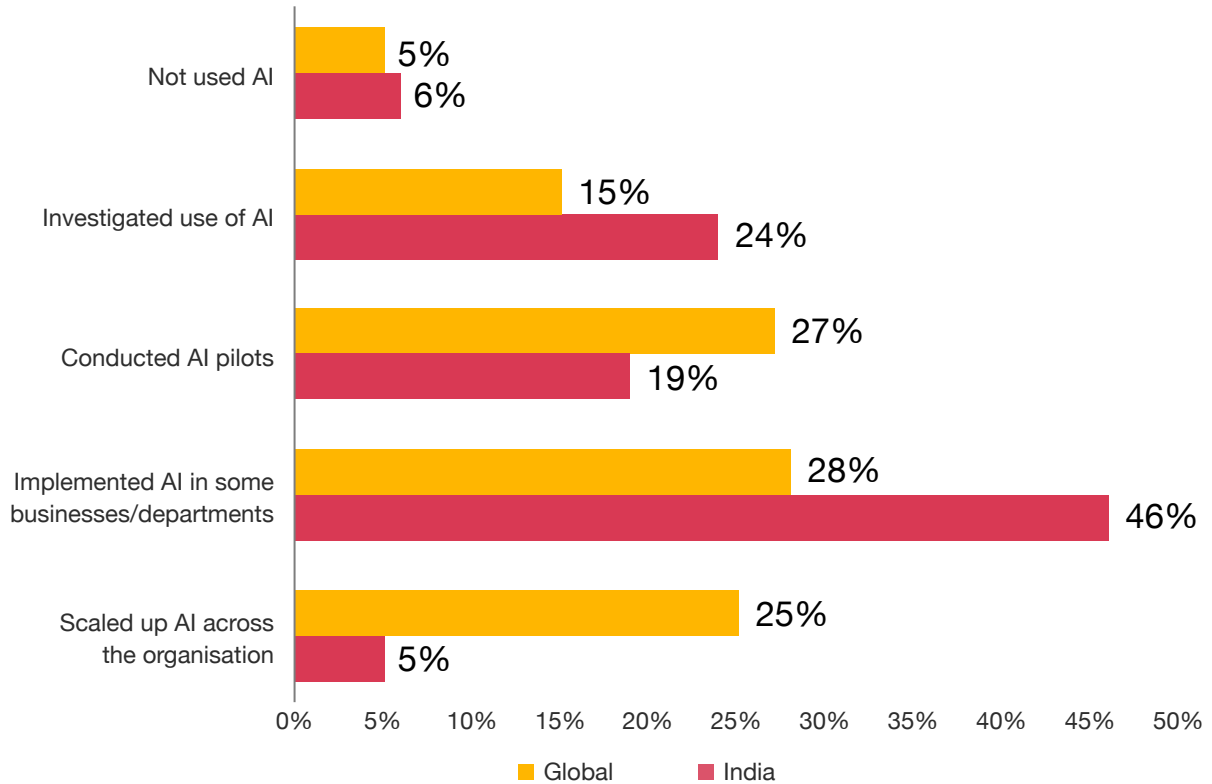
Source: PwC analysis

The increased adoption of AI can be attributed to the following factors:

01 Post COVID-19, AI-enabled use cases like contactless selling and delivery have gained traction due to changes in buying behaviour.

02 As organisations are reopening their manufacturing and office locations, AI-enabled tools are helping them enforce best practices from a health and safety perspective.

03 The remote workforce is relying more on AI-enabled digital assistants to do their work without loss of productivity.

04 As past knowledge and experience may fail to provide the right insights in these times of disruption, organisations are increasingly making decisions based on current data using AI-enabled predictive and prescriptive tools.
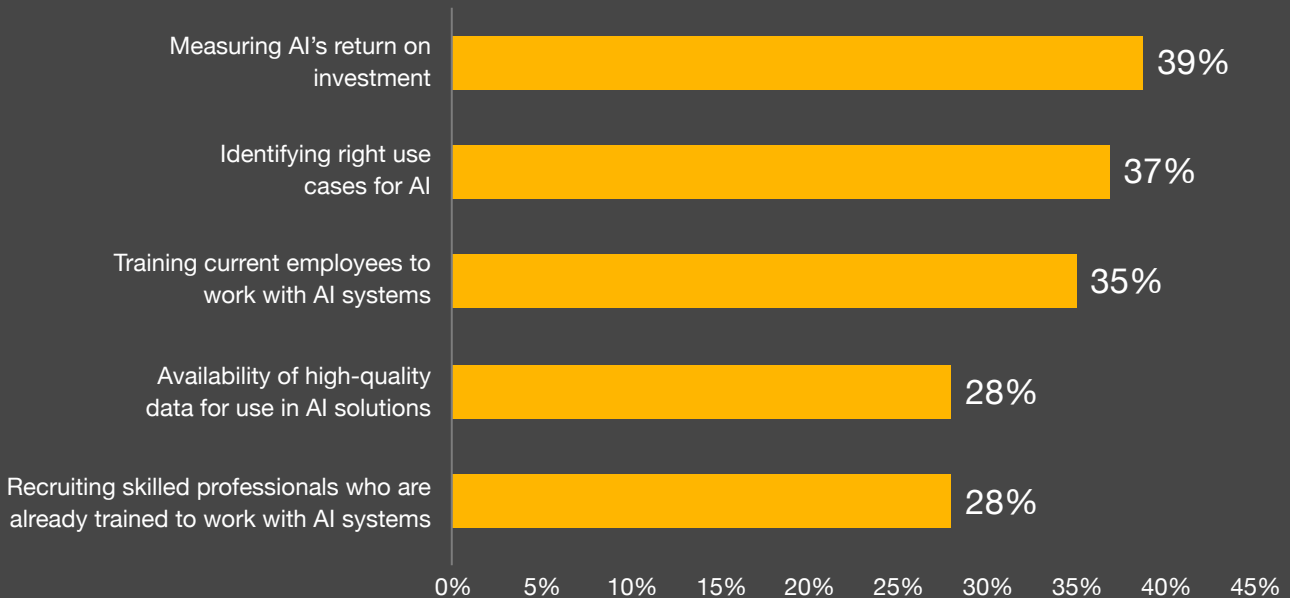
05 To reduce cost of doing business, combat disruption and become future ready, organisations are adopting AI-based digital twins and synthetic data. This is also enabling them to build resilient ecosystems (e.g. supply chain and operations).
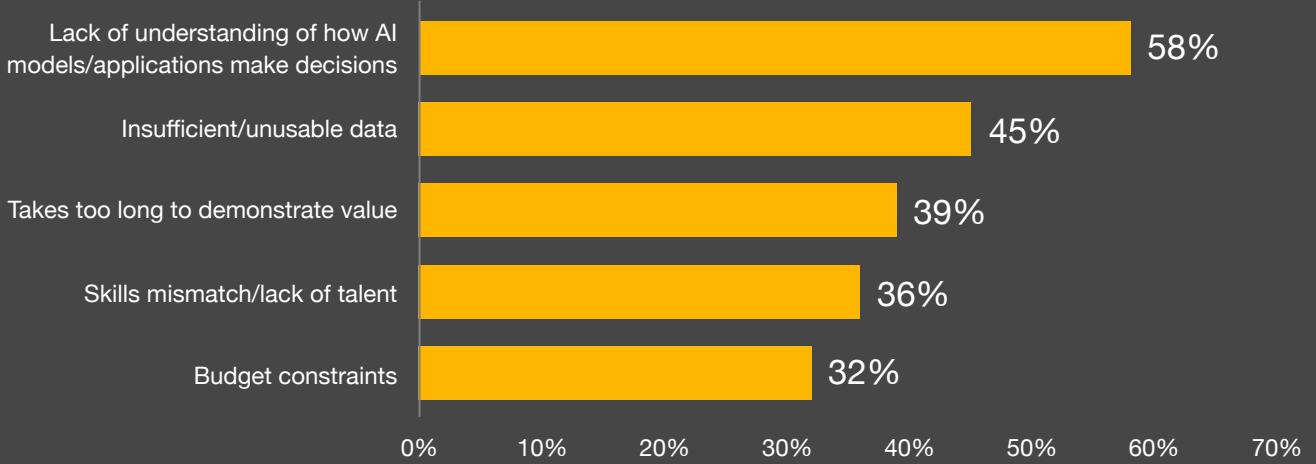
Changing priorities and risk awareness

As organisations mature along the AI journey and move from implementing pilot AI projects to scaling them up at the enterprise level, the nature of the challenges they face evolves from purely technical or data-related constraints to more business-related constraints such as RoI calculation and selection of the right use cases.

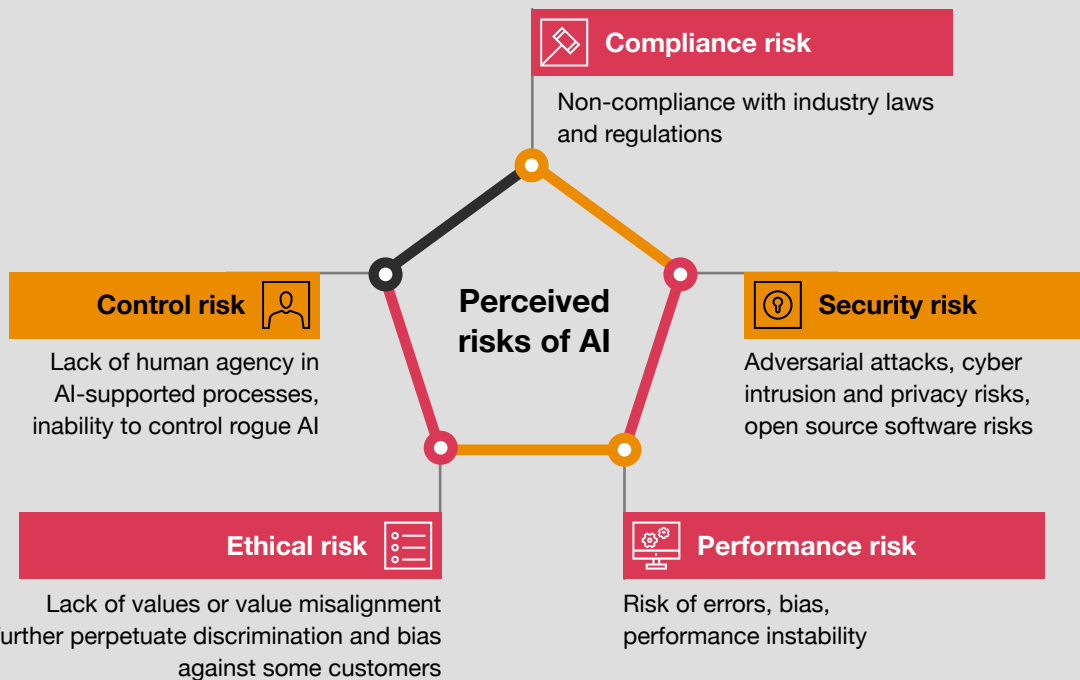**Top inhibitors in 2020 (post COVID-19)**

Inhibitor	Percentage
Measuring AI's return on investment	39%
Identifying right use cases for AI	37%
Training current employees to work with AI systems	35%
Availability of high-quality data for use in AI solutions	28%
Recruiting skilled professionals who are already trained to work with AI systems	28%

Source: PwC analysis

Top inhibitors in 2019

Inhibitor	Percentage
Lack of understanding of how AI models/applications make decisions	58%
Insufficient/unusable data	45%
Takes too long to demonstrate value	39%
Skills mismatch/lack of talent	36%
Budget constraints	32%

Source: PwC report 'With AI's great power comes great responsibility' (October 2019)

The nature of inhibitors to adoption has changed significantly in the last one year. In 2019,[9] the challenges were more technical in nature (e.g. inability to explain the model or lack of availability of data and in-house skills). In 2020, the greatest inhibitor to AI adoption is not technical capabilities but measuring the business value or RoI from AI initiatives and selection of appropriate AI use cases. The shift in the nature of inhibitors from technical to business is natural as organisations who were primarily focusing on pilots and proofs of concept (PoCs) are now attempting to scale up these solutions at the enterprise level. The change in the nature of inhibitors clearly signals an improvement in the maturity and willingness of organisations in terms of adopting AI as a tool for achieving business outcomes.

With the shift in focus towards business challenges, however, organisations should not overlook the risks associated with scaling up AI solutions.

Perceived risks of AI

Compliance risk
Non-compliance with industry laws and regulations

Control risk
Lack of human agency in AI-supported processes, inability to control rogue AI

Security risk
Adversarial attacks, cyber intrusion and privacy risks, open source software risks

Ethical risk
Lack of values or value misalignment further perpetuate discrimination and bias against some customers

Performance risk
Risk of errors, bias, performance instability

Source: PwC analysis

The financial services and telecom, media and technology (TMT) sectors are particularly concerned about ethical risks, whereas the travel and hospitality sector considers compliance risks to be the most important ones to manage.

9   https://www.pwc.in/assets/pdfs/consulting/technology/data-and-analytics/with-ai-s-great-power-comes-great-responsibility.pdf

Risk prioritisation across sectors

	All	Financial services	Healthcare and pharma	Industrial products	Retail and consumer	TMT	Travel and hospitality
Control risk	48%	48%	50%	53%	52%	**61%**	29%
Ethical risk	49%	**61%**	37%	53%	55%	**64%**	32%
Performance risk	48%	48%	47%	**53%**	48%	46%	47%
Security risk	36%	45%	37%	28%	52%	**54%**	26%
Compliance risk	48%	42%	53%	44%	34%	46%	**63%**

Source: PwC analysis

While different sectors have different priorities based on their perception of risks from AI solutions, a wider recognition of the need to understand and mitigate these risks appears to be lacking among organisations. A methodical approach is required to identify and remediate these risks.[10]

Toolkits like PwC's Responsible AI[11] can provide organisations the tools to address these risks in a structured manner.

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10 https://www.pwc.co.uk/data-analytics/documents/model-risk-management-of-ai-machine-learning-systems.pdf

11 http://pwc.com/rai
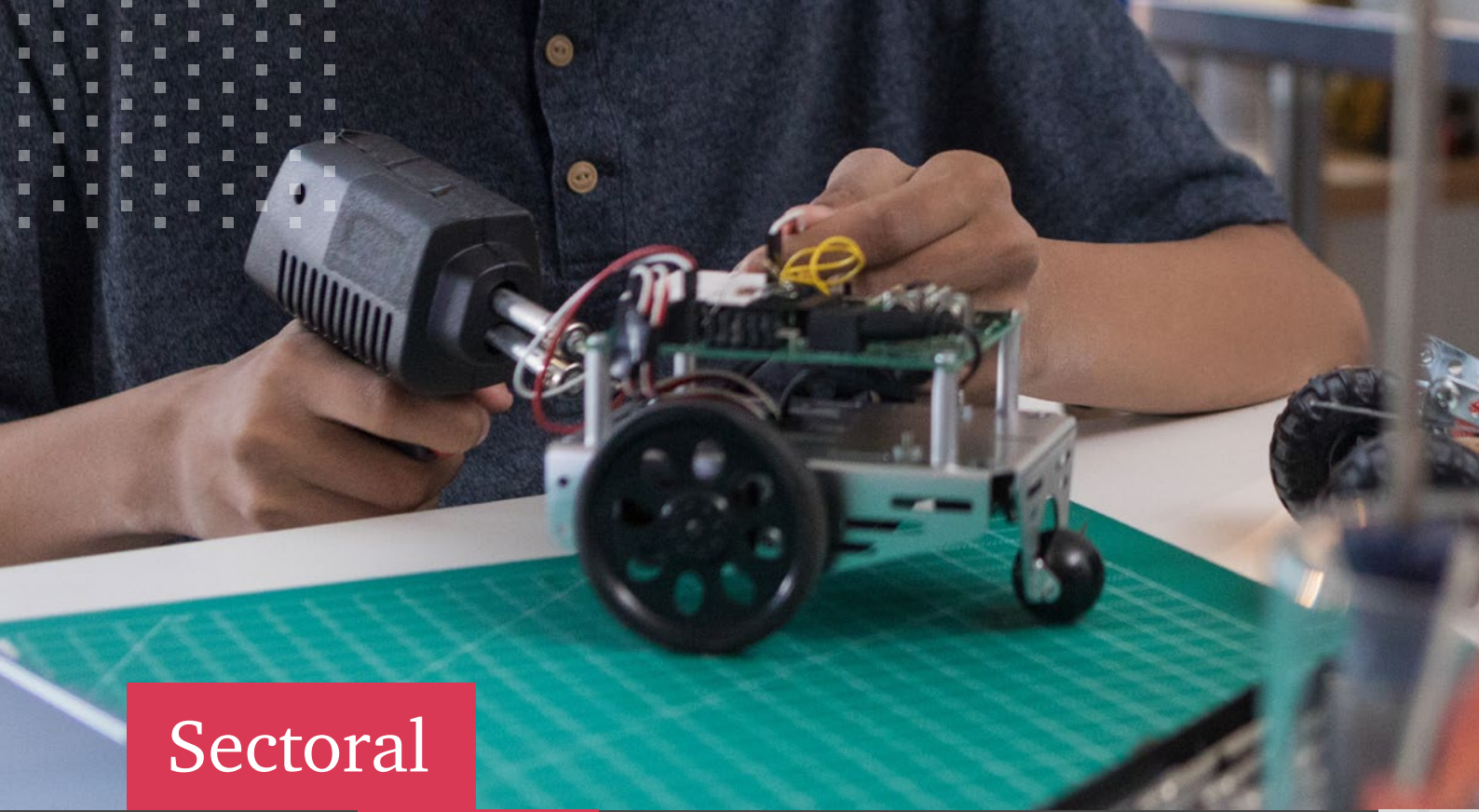
Sectoral view

Sector-wise adoption trends

Sectors which have faced the most disruption due to COVID-19 have embraced AI in a more definitive manner because for them it is more of a business necessity than a 'good-to-have' solution. Travel and hospitality (89%) has taken the lead in AI implementation, followed by TMT (86%), financial services (82%), and healthcare and pharma (73%).

Opportunities for AI adoption
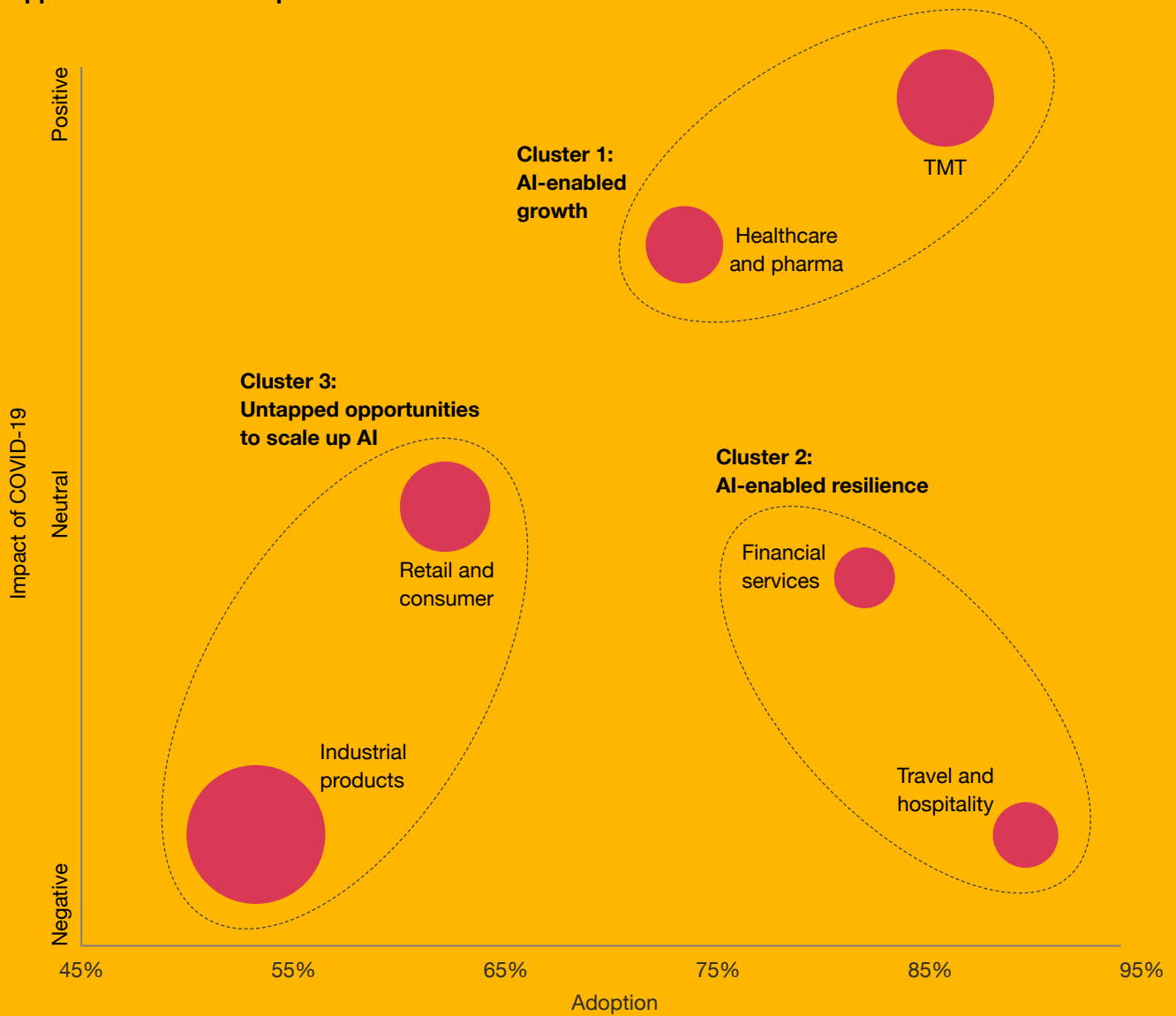
Adoption – calculated as the percentage of firms that have implemented pilot AI programs within some areas of the organisation, have deployed AI solutions in some areas of the organisation or have deployed enterprise-wide AI solutions at scale
Bubble size indicates the relative size of the sector.

Source: PwC analysis

While COVID-19 has had a negative economic impact on some industries, it has also positively impacted businesses that have been high adopters of technology. Analysis of sector-wise adoption shows that industries where significant AI opportunities lie can be categorised into three distinct clusters:

Cluster 1

AI-enabled growth:

Industries like TMT and healthcare and pharma have adopted AI solutions to seize the emerging opportunities during the present crisis. AI-based solutions are helping them to innovate and scale up.

Cluster 2

AI-enabled resilience:

Industries which have been adversely impacted by the COVID-19 pandemic, such as travel and hospitality and financial services, are adopting AI to navigate the increased business uncertainties and disruptions.

Cluster 3

Untapped opportunities to scale up AI:

The industrial products and retail and consumer sectors have a huge opportunity to catch up on their AI adoption journey.

Do companies adopting AI see the benefits?
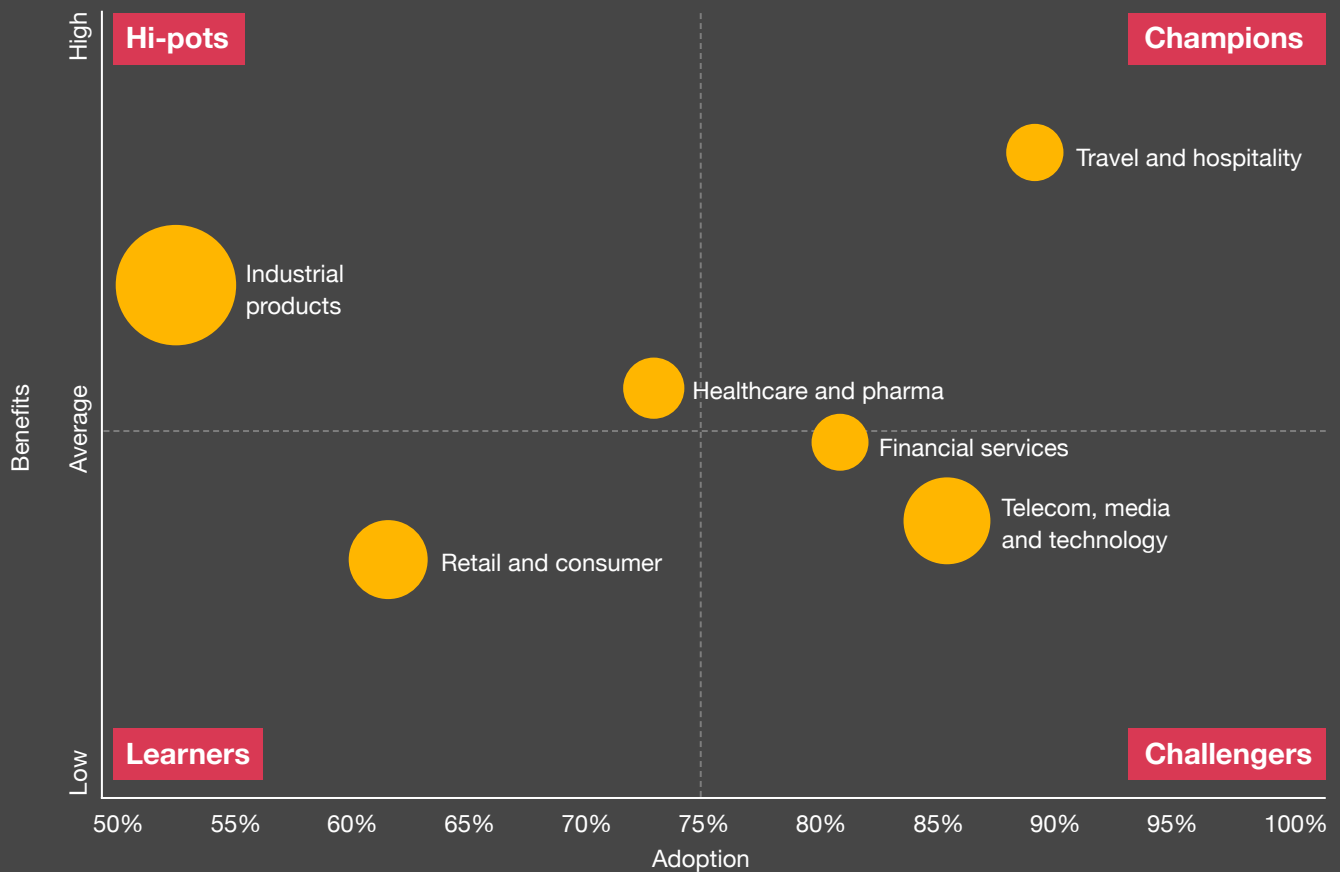
Adoption – calculated as the percentage of firms that have implemented pilot AI programs within some areas of the organisation, have deployed AI solutions in some areas of the organisation or have deployed enterprise wide AI solutions at scale
Benefits – Perception of benefits realised after adoption of AI by respondents, categorised as low, average or high
Bubble size indicates the relative size of the sector.

Source: PwC analysis

Benefit–adoption matrix

Maximising the benefits from an AI adoption effort requires correctly identifying the focus areas and use cases which make a difference to the business. We see industries falling into four categories when it comes to propensity to adopt AI and realisation of benefits.

01 **Learners:** Industries and firms in this region lag behind on both adoption of AI as well as benefit realisation and are still learning to scale up and deliver benefits. Companies in this region need to focus on overcoming the inhibitors to realise full potential of AI.

02 **Hi-pots:** Industries and firms in this region have low adoption but have been able to drive significant benefits. The pilots have yielded a good RoI and they now need to scale these up to realise the full benefits. The focus needs to be on enhancing awareness about AI and removing misconceptions and inhibitions around widespread adoption across the organisation.

03 **Challengers:** AI solutions have almost become table stakes in these industries and are a bare minimum requirement to stay competitive. However, additional competitive advantage can be achieved if these organisations

implement innovative use cases or are able to drive greater value from existing use cases through improved implementations. Business risks associated with failed implementations can be quite high and hence it would be better to follow a very structured approach in order to mitigate such risks.

04 **Champions:** Industries or organisations in this category lead in terms of adoption, with high adoption rates coupled with high value realisation. These firms need to constantly look out for new use cases and technologies that keep them fit for future and help them tackle the threat of disruption from established peers and emerging start-ups.
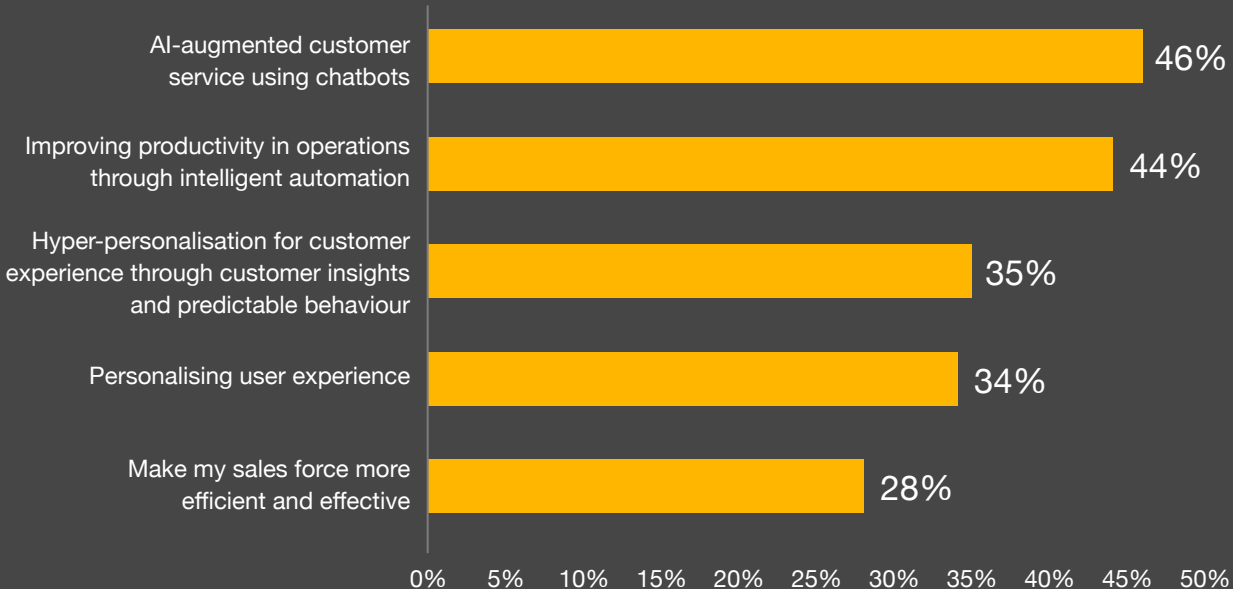
Use case view

Front office transformation has undergone the initial wave of customer relationship management (CRM) implementation and is now embracing AI-enabled solutions to tide over a post-pandemic crisis where both demand and supply have been volatile.

Top 5 use cases

Use case	Percentage
AI-augmented customer service using chatbots	46%
Improving productivity in operations through intelligent automation	44%
Hyper-personalisation for customer experience through customer insights and predictable behaviour	35%
Personalising user experience	34%
Make my sales force more efficient and effective	28%

Source: PwC analysis

Two themes are emerging out of the use cases where AI is being used.

1. Front office transformation: Out of the top five use cases, four are related to front office activities such as customer service, personalisation, sales force productivity and user experience.

Customer service has been affected adversely by the COVID-19 crisis, leading to an increased interest in automation to meet the needs of customers. Chatbots (46%) have augmented employees in support functions to keep up with the demands of customers during the crisis.[12]

2. Automation: Organisations (44%) are using AI to automate routine decision making and delegate it to algorithms for both front and back office processes.[13]

It is important to highlight that in developing economies like India, AI-driven intelligent automation needs to be focused more on augmenting workforce capabilities[14] and improving the market demand. Economic gains achieved through a focus on cost reduction using automation will be offset by the social cost of workforce displacement and such gains might be short-lived and unsustainable.

Enhance and Explore framework

Organisations need to take a strategic view and maintain a pipeline of use cases that helps them reconfigure and prepare for the new normal. PwC's Enhance and Explore framework assesses the typical footprint of AI-based use cases that firms have implemented or are planning to implement.

Enhance: AI-enabled use cases in this category have high current use and are also expected to have high adoption in the future.

Explore: Use cases in this category are at the exploratory stage and are expected to have wider acceptability and usage in the medium-to-long term.
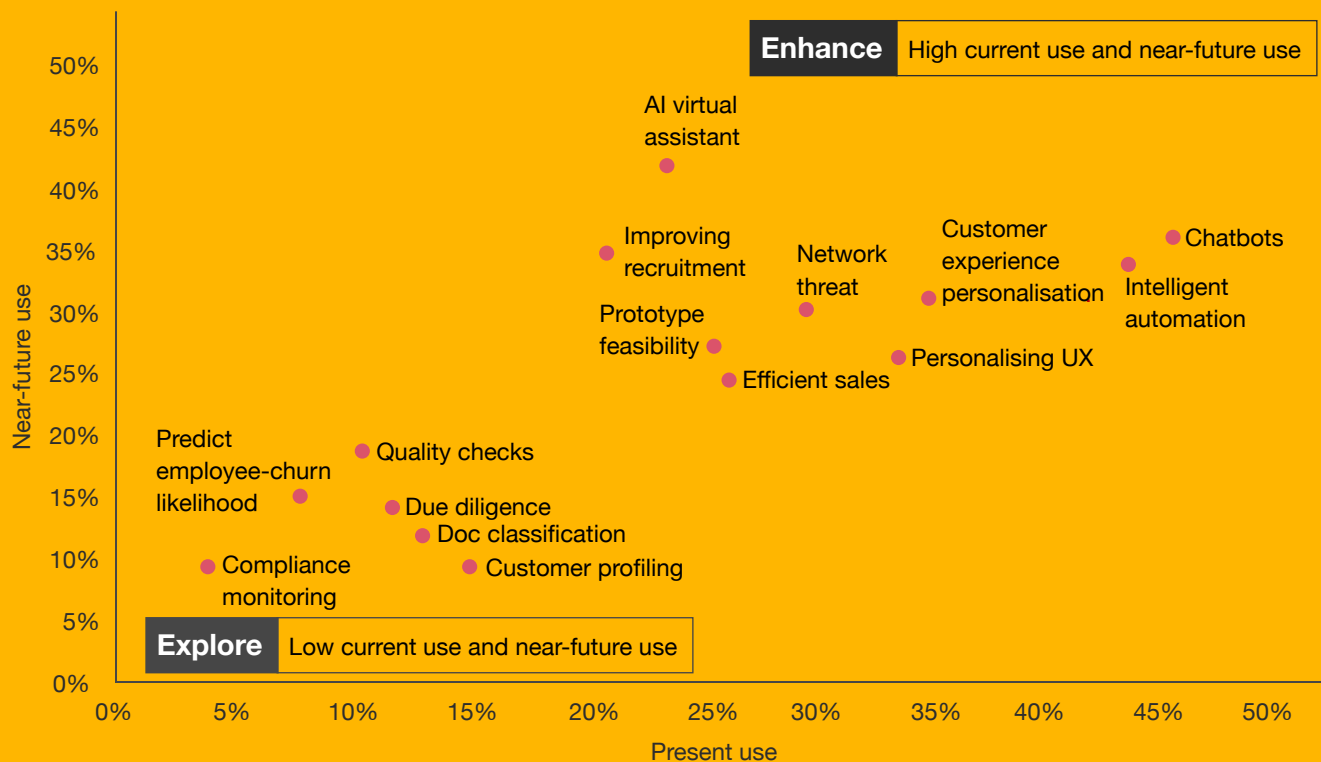
Present use – percentage of firms that have currently adopted the plotted AI use case
Near-future use – percentage of firms that are looking to adopt the plotted AI use case in the next 2 years
Source: PwC analysis

12 PwC analysis and survey results

13 Ibid.

14 PwC recognises augmented intelligence as one of the four scenarios in which AI is being applied today, i.e. when adaptive AI systems help people to make better decisions. More details on the four scenarios in which AI is being applied can be found in PwC's 'Sizing the prize' report.

While the above chart mostly lists use cases that have cross-industry applications, there are numerous industry-specific use cases (e.g. drug discovery and anti-money laundering) that can be plotted similarly along the Enhance and Explore spectrum.

On doing this, we discovered some interesting insights into the future of AI usage. For example, 35% of the firms in the healthcare and pharma sector are exploring AI-enabled demand forecasting and inventory management. This use case can have

a significant impact for early adopters before the other 65% of the firms in the sector explore it. The figure below details the categorisation of AI implementation across sectors, as per the Enhance and Explore framework.

Sector	Enhance	Explore
Travel and hospitality	Dynamic pricing model (71%*)	Context-aware, targeted marketing (20%)
Healthcare and pharma	Clinical trial and drug discovery (67%)	Demand forecasting for inventory management (35%)
Financial services	Fraud detection and anti-money laundering (79%)	Reducing loan underwriting bias and risks (34%)
Retail and consumer	Hyper-personalisation of customer experience (75%)	Personality profiling of call centre agents/ customers (11%)
Industrial products	AI-based virtual assistants for improved learning and development (64%)	Intelligent sanctions and compliance monitoring (10%)
Telecom, media and technology	Network threat prevention and detection (68%)	Intelligent and faster ticket management (12%)

*Percentage figures reflect the percentage of firms in that sector currently implementing the use case or that will do so in the next couple of years. The list of use cases is not exhaustive.

Source: PwC analysis

Industry outlook

We measured multiple parameters across each industry to understand their objectives with respect to AI adoption. Our findings have been summarised below.[15]

Travel and hospitality

Much of the travel and hospitality sector is looking at AI-powered digital solutions to reconfigure business processes[16] and promote contactless experiences, safety and long-term operational changes. The rapid generation of data has helped the sector to drive pilots but when it comes to scaling up the solutions, the sector has witnessed challenges around the complexity and cost of implementations.[17]

- Business function with highest AI adoption – customer service
- Business benefit – high
- Top current use case – customer service chatbots
- Top future use case – personalising user experience
- Top challenge – scaling pilots to production
- AI investment focus – identifying more AI opportunities

Industrial products

AI has enabled the industry to make significant gains in the domains of manufacturing and operations. The usage of AI has improved productivity in operations (44%), predictive maintenance (38%) and better demand forecasting (28%).[18]

- Business function with highest AI adoption – supply chain and logistics
- Business benefit – high
- Top current use case – improving productivity in operations using intelligent automation
- Top future use case – improving asset performance using predictive maintenance
- Top challenge – training current employee to work with AI systems
- AI investment focus – change management (adopting new ways of working)

Retail and consumer

The industry is taking initiatives for wider adoption of AI, with 86% of the firms investing in identifying more pilots for AI implementation. The sector has a special focus on change management (66%) to equip the workforce to move from traditional and conventional technologies to cognitive technologies.

- Business function with highest AI adoption – sales and marketing
- Business benefit – low
- Top current use case – hyper-personalising customer experience
- Top future use case – AI-augmented customer service chatbots
- Top challenge – measure AI's return on investment
- AI investment focus – identifying more AI opportunities

15 Source for infographics: PwC analysis
16 https://analyticsindiamag.com/how-artificial-intelligence-can-help-aviation-industry-with-contactless-flying-amid-the-crisis/
17 https://www.strategyand.pwc.com/gx/en/insights/industry-trends/2019-transportation-logistics.html
18 PwC analysis and survey results

Industry outlook

Telecom, media and technology

The TMT industry has been at the forefront of AI adoption, with around 10% of TMT organisations already implementing AI solutions on scale at the enterprise level. Over the next couple of years, the industry will invest in the development of data-driven recruitment (46% firms) and AI-based virtual assistants for learning and development capabilities (46% firms).

- Business function with highest AI adoption – IT and cyber security
- Business benefit – medium
- Top current use case – network threat identification and prevention
- Top future use case – improving recruitment and onboarding new employees
- Top challenge – identifying right use cases for AI
- AI investment focus – recruiting and developing technical talent to build AI solutions

Financial services

The financial services sector has focused on the core processes of the value chain such as customer service (73%), fraud detection (58%) and due diligence (30%). The biggest challenge is the high quality of data (40%) required to develop accurate solutions, and the sector (approximately 70% firms) is keen to invest in improving data quality and developing external third-party data partnerships to accelerate the process.

- Business function with highest AI adoption – customer service
- Business benefit – medium
- Top current use case – AI-augmented customer service chatbots
- Top future use case – fraud detection and anti-money laundering
- Top challenge – availability of high-quality data for AI use
- AI investment focus – improving data quality and external data partnerships

Healthcare and pharma

The healthcare sector has been leveraging AI to resolve core business problems, with R&D being the primary area of implementation (57%). AI has helped healthcare and pharma firms to drastically expedite clinical trials and drug discovery, and reduced the time consumed from years to, in some cases, days, consequently leading to huge savings in expenses. AI is also solving complex questions around genome sequencing and protein structures. The sector is looking to adopt AI in customer-oriented functions, e.g. implementing chatbot guidance systems (47%) and hyper-personalising patient care through customer insights (40%).

- Business function with highest AI adoption – R&D, Innovation
- Business benefit – medium
- Top current use case – clinical trial and drug discovery
- Top future use case – determine prototype feasibility
- Top challenge – scaling pilots to production
- AI investment focus – implementing AI technologies and platforms

Way forward

How can organisations drive value out of AI investments?

Organisations adopting AI applications often face multiple challenges and fail to realise the optimum value from their AI investments on people, processes and technologies. A structured approach towards implementing AI can help overcome these challenges. PwC recommends a step-by-step guide to build a resilient AI ecosystem.

01 **One in four enterprises finds it difficult to secure enough investment and buy-in from its leadership.**

- Make AI projects accessible in as many departments as possible, focusing on shared ownership.
- Start small and with pilot-focused scoping to quickly show the value and get buy-in.[19]

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19 https://www.pwc.in/consulting/digital-transformation/artificial-intelligence.html

02   37% of organisations find it challenging to identify the right use cases for AI implementation.

- Based on the leadership buy-in and organisational goals, start early identification of the realistic, achievable and quick-win use cases from the wider range of analytics automation and digital-driven needs.
- PwC's use case criticality evaluation criteria[20] help drive use cases across six different factors (see image below).

Use case criticality components

Revenue
The total of the economic impact of a single prediction, the economic utility of understanding why a single prediction was made, and the intelligence derived from a global understanding of the process being modelled.

Rate
The number of decisions that an AI application has to make e.g. two billion per day versus three per month.

Rigour
The robustness for the application: its accuracy and ability to generalise well to unseen data.

Regulation
The regulations determining the acceptable use and level of functional validation needed for a given AI application.

Reputation
How the AI application interacts with the business, stakeholders, and society and the extent a given use case could impact business reputation.

Risk
The potential harm due to an adverse outcome resulting from the use of the algorithm that goes beyond the immediate consequences and includes the organisational environment: executive, operational, technology, societal (including customers), ethical and workforce.

Source: PwC analysis

03   28% of enterprises lack high-quality data for use in AI solutions.

- Identify the data sets that you need in order to train AI to solve specific business problems, then prioritise capturing and labelling that data in line with enterprise-wide standards.[21]
- Use synthetic data generation and new AI data tools like lean and augmented data learning, transfer learning and other AI approaches that can help do more with less, much more easily.

04   28% of firms report training and recruiting skilled professionals who can work with AI systems as a hurdle.

- Plan opportunities and recognition for upskilling and retraining.
- Develop a citizen-led culture to provide employees the tools, platforms and incentives to learn and apply skills, and back it up through compensation and recognition.[22]
- Create a multilingual environment where data engineers, data ethicists, data scientists, and machine learning (ML) Ops engineers can collaborate with each other.
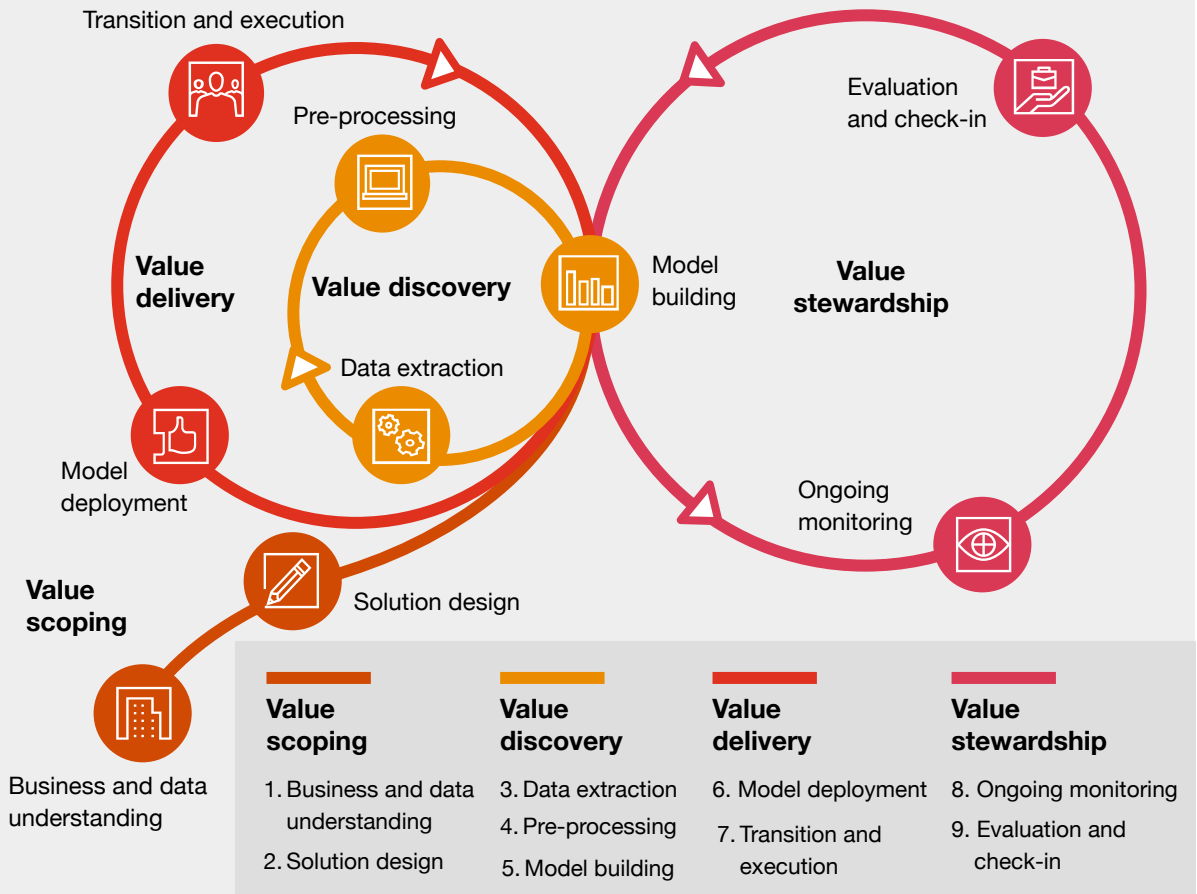
20   https://www.pwc.co.uk/audit-assurance/assets/explainable-ai.pdf

21   https://www.pwc.com/us/en/services/consulting/library/artificial-intelligence-predictions-2019.html

22   https://www.pwc.com/us/en/services/consulting/library/artificial-intelligence-predictions-2020.html

05 35% of organisations that have implemented pilots are finding it tough to move AI initiatives from pilot to production.

- Ensure availability of high-quality and unbiased datasets and use cases that align with organisational goals and values. Cognitive assets, company-wide capabilities, a formalised, time-bound approach and robust infrastructure can help deploy AI solutions from pilot to production.
- Use an experiment-driven model life cycle to break down and construct AI projects through iterative feedback loops and value-aligned building blocks. PwC's model life cycle with feedback loops helps establish the iterative processes needed to succeed in building and deploying AI.

PwC's 9 step iterative model development cycle

Value scoping	Value discovery	Value delivery	Value stewardship
1. Business and data understanding	3. Data extraction	6. Model deployment	8. Ongoing monitoring
2. Solution design	4. Pre-processing	7. Transition and execution	9. Evaluation and check-in
	5. Model building		

The model development life cycle has three iterative phases of value discovery, delivery and stewardship.

06 39% of organisations are unable to explain the output and measure AI's RoI.

- Ensure that AI deployment efforts address five key questions to solve the challenges of explainability – (i) whom to explain to? (ii) why explain? (iii) when to explain? (iv) how to explain? (v) what is the explanation?[23]

- Simulation techniques and digital twins will allow you to consider thousands of potential outcomes and then select the best strategic bets, option-value bets and no-regret strategies that are robust, thus minimising any negative impact on investment and efforts.[24]

- For the RoI to be realistic, it is important that you are able to trust the decisions made by AI. PwC's Responsible AI – a suite of customisable frameworks, tools and processes – can help explain both overall decision making, as well as individual choices and predictions made by AI systems.[25]

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23 https://towardsdatascience.com/five-critical-questions-to-explain-explainable-ai-e0c40bdca368

24 https://www.pwc.com/us/en/services/consulting/analytics/artificial-intelligence.html

25 https://www.pwc.com/rai

07 | **One in five organisations finds it challenging to create AI-related governance policies across the business.**

- Given the ubiquity and pervasive nature of technology in business, prioritise management of risks and controls at every step of the AI journey – from strategy and planning to monitoring of deployed solutions.
- Consider existing AI deployment capabilities and the vendor ecosystem, along with the unique model development, model monitoring and compliance processes.[26]
- Instil confidence on the customer and compliance front, install capabilities for expanded business reporting.

08 | **17% of firms face challenges in maintaining AI systems that are already operational.**

- Build oversight mechanisms to monitor how AI models perform over time and develop robust maintenance procedures to update the models before business is affected by value decay, hidden costs and other unforeseen changes in the environment (e.g. cascading technical debt, falling adoption due to lack of transparency or bias creep).[27]

09 | **20% of organisations find it challenging to scale up AI solutions at the enterprise level.**

- Embed AI into your overall IT stack to scale up its use and support a common AI services layer that allows multiple applications to integrate with AI models.
- Develop ML operations combining expertise in data science, software engineering and IT operations.
- Make your data 'trustworthy', i.e. not only accurate but also standardised, labelled, complete, free of bias, compliant with regulations and secure to scale.[28]

10 | **38% of organisations plan to use AI to deliver rapid innovation in a post COVID-19 world.**

- In a rapidly changing post COVID-19 world, it is more important than ever to rethink and reconfigure to become dynamic and resilient to future disruptions. As organisations try to drive market-leading innovations through the use of AI, it is important to build capabilities to:
  - continually sense market variables, assess the range of scenarios and most favourable outcomes
  - gather feedback on experiments by reinforcing causal feedback loops
  - build and improve capabilities to address the feedback.[29]

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26 https://www.pwc.com/gx/en/issues/data-and-analytics/artificial-intelligence/what-is-responsible-ai.html

27 https://hbr.org/sponsored/2020/10/why-most-organizations-investments-in-ai-fall-flat

28 https://www.pwc.com/us/en/services/consulting/library/artificial-intelligence-predictions-2020/operationalize-ai-integrated-and-at-scale.html

29 https://www.strategy-business.com/article/How-to-build-disruptive-strategic-flywheels?gko=3ed00

Notes

Categorisation	Industry
FS	Banking, capital markets and private equity, financial services, asset and wealth management, insurance, digital payments, fintech
Healthcare	Pharmaceuticals and life sciences, hospitals, pharmacies and diagnostic centres, healthcare
IP	Automotive, engineering and construction, industrial manufacturing, metals and mining, petroleum, petrochemical, oil and gas (upstream and downstream), power and utilities, chemicals
Others	Others
R&C	Organised Retail, e-commerce, services (e.g. hyperlocal, advertising, market research), consumer goods
TMT	Telecom and communications, media and entertainment, technology
Travel and hospitality	Transportation and logistics (airline, railways, organised bus transport, delivery, ports, airports), hospitality and leisure (hotels, aggregators, tourism, etc.)

Glossary

Abbreviation	Sector
FS	Financial services
H&P	Healthcare and pharma
IP	Industrial products
R&C	Retail and consumer
T&H	Travel and hospitality
TMT	Telecom, media and technology

Abbreviation	Business function
CS	Customer service
F&T	Finance and tax
HR	Human resources
IT&CS	Information technology and cyber security
M&O	Manufacturing and operations
R&D	Research and development, innovation
RL&C	Retail, legal and compliance
S&M	Sales and marketing
SC&L	Supply chain and logistics

About PwC

At PwC, our purpose is to build trust in society and solve important problems. We're a network of firms in 155 countries with over 284,000 people who are committed to delivering quality in assurance, advisory and tax services. PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see www.pwc.com/structure for further details.

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