Can enterprise intelligence be created artificially?

A survey of Indian enterprises

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Foreword

Artificial Intelligence (AI) is emerging as a potent force for enterprises to innovate and transform through technology and business model disruption. Organizations across sectors are realizing the potential of AI in diverse areas such as cost optimization, operational efficiency, customer experience and revenue growth. AI adoption is a critical competitive lever. It enables business leaders to infuse technology at speed, while keeping humans at the centre to create long-term value.

NASSCOM and EY recently conducted a survey of 500+ CXOs across India to study the maturity of AI adoption along with key challenges faced in their enterprise AI journeys.

The survey respondents represented multiple sectors. However, retail, BFSI, healthcare and agriculture constituted the major focus of this study.

The survey responses revealed rich insights in areas such as AI strategy, planning and deployment. In addition, the qualitative responses from several business leaders helped us in formulating practical recommendations for implementing AI solutions.

We are building on the current study by developing sectoral playbooks which will enable business leaders to accelerate AI adoption in their respective industries.

We hope that you enjoy reading the report. As always, we look forward to your feedback and suggestions.

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⬡ Business leaders appreciate the need to deploy AI for staying competitive and generating long-term value

▶ **~60%** of the business leaders surveyed believe that AI will disrupt their businesses within three years, yet only **25%** of enterprises have deployed AI solutions

▶ Operational **efficiency,** customer **experience** and revenue **growth** are the top-three reasons for implementing AI

▶ From amongst our four key focus sectors, **BFSI** takes the lead on AI adoption with (**36%**) organizations leveraging AI, followed by **Retail (25%), Healthcare (20%)** and **Agriculture (8%)**

⬡ In order to enhance AI adoption, four key impediments need to be addressed

▶ **56%** of respondents believe **low external ecosystem maturity,** especially with respect to technology and service providers, restricts their ability to accelerate AI initiatives

▶ **53%** report that **inability to quantify benefits** is a key factor impeding AI adoption

▶ **40%** of business leaders state that **talent shortage** is a key hurdle in implementing and scaling AI solutions

▶ **47%** consider **AI explainability** as a primary reason for holding back AI-led decision making
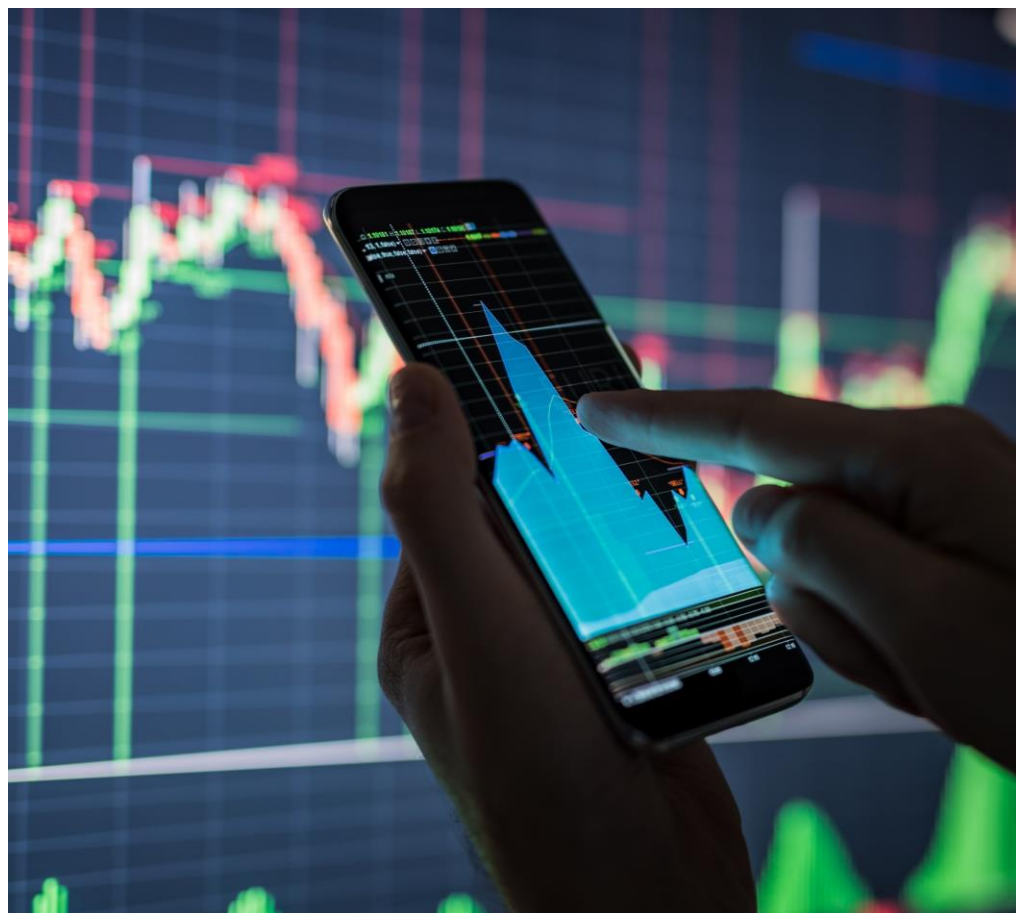
Business leaders report differences in their experiences with, and perceptions regarding, AI adoption

|	Enterprises that have deployed AI	Enterprises that have not deployed AI
Functional focus	**Top three functional focus areas are:** ▶ Operations (60%) ▶ Customer service (58%) ▶ IT (48%)	**Top three areas of interest are:** ▶ Operations (71%) ▶ Marketing and communications (48%) ▶ Production (47%)
Challenges to adoption	**Technology and data** Concerns include low ecosystem maturity (56%), low digitization (36%), disparate datasets (35%) and inadequate training data (34%) **Ability to quantify ROI** 34% state that unavailability of appropriate use cases is a roadblock **Talent and culture** 19% state that workforce displacement is an actual risk, but can be mitigated with strong change management and training/reskilling **Trust, ethics and regulation** AI explainability and bias are core concerns that can result in, or may have led to an adverse business impact	**Technology and data** Concerns include low ecosystem maturity (56%), low digitization (58%), disparate datasets (33%) and inadequate training data (38%) **Ability to quantify ROI** 47% perceive unavailability of use cases as a major roadblock **Talent and culture** 40% perceive that workforce displacement will be a risk, with stiff resistance from employees **Trust, ethics and regulation** Data security, privacy, brand reputation, and safety/security of people and equipment are top-of-mind concerns

The "art of possible" for accelerating AI adoption

▶ Strategic **planning** and integrated **governance** go a long way in helping enterprises successfully deploy AI solutions by effectively leveraging data, technology and talent

▶ **74%** of respondents have established either a formal strategy or obtained C-suite sponsorship to initiate or scale-up their AI programs

▶ Trust is the lynchpin to enterprise-wide AI adoption. **57%** of business leaders stated that they trust AI to make strategic and/or operational decisions

▶ **88%** of respondents state that their risk management frameworks require improvement to address AI-specific concerns in areas such as ethics, accountability and explainability

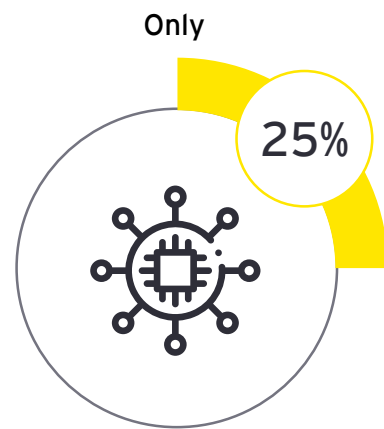▶ **78%** of the respondents prefer re-skilling their existing workforce as the primary talent strategy

AI reality check
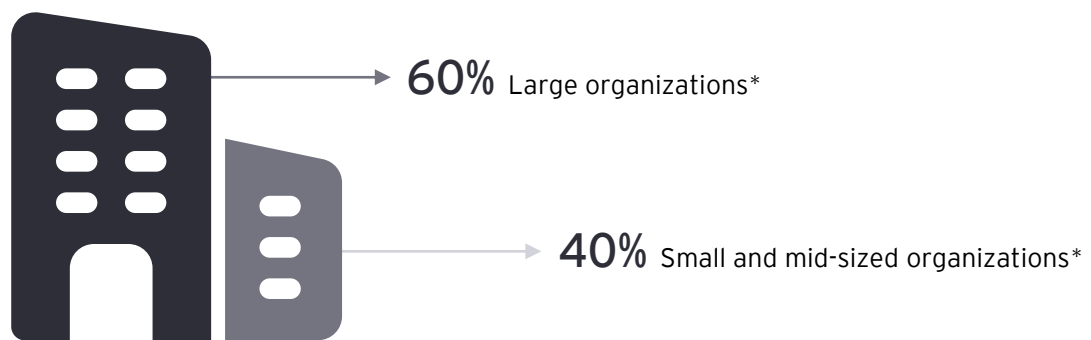

1

While

60%
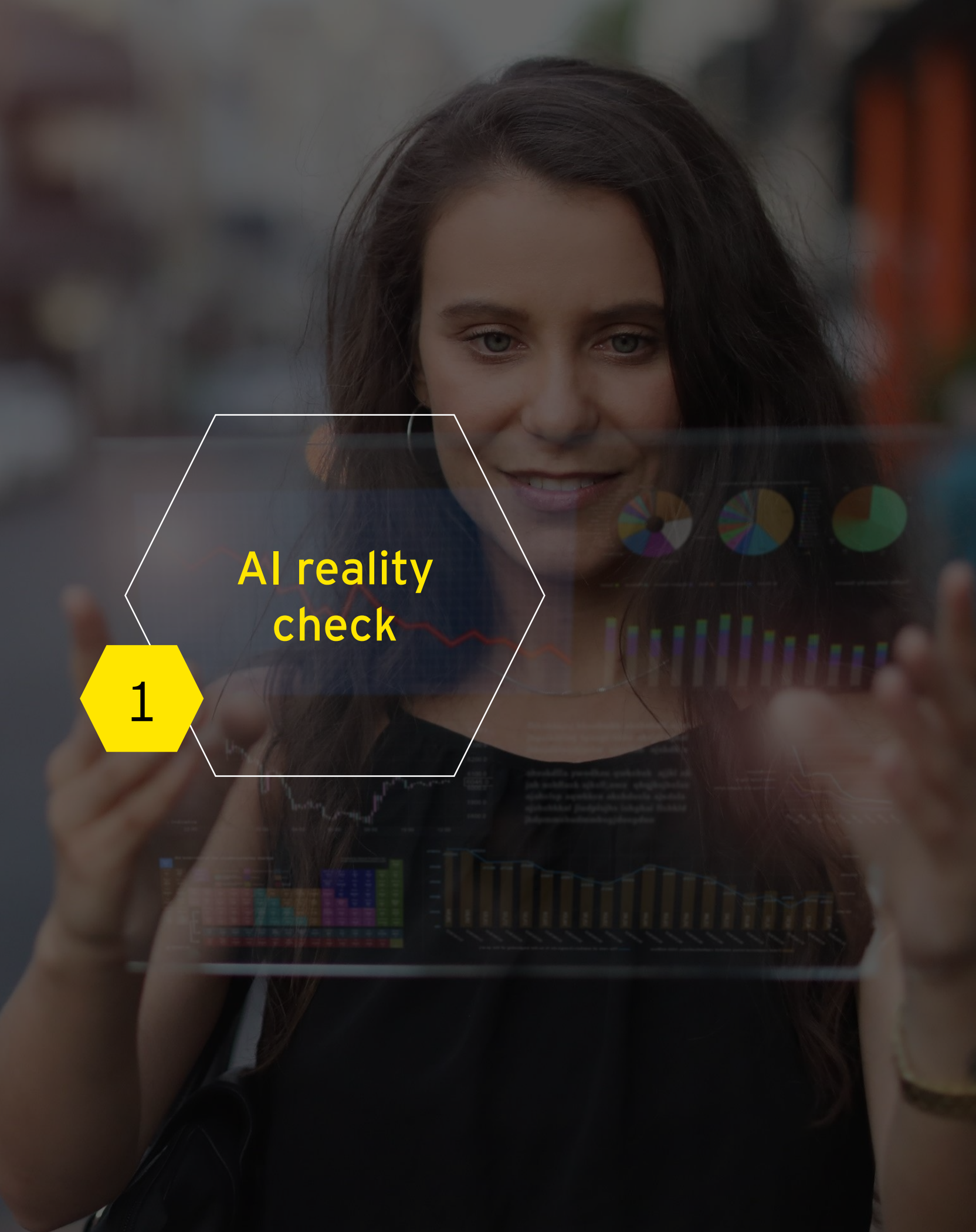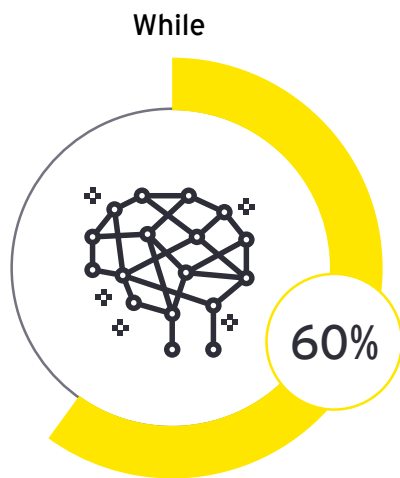
CXOs believe that **AI will disrupt** their businesses

Only

25%

have **deployed AI** solutions to transform their business

Size of the organization does not matter for AI adoption

60% Large organizations*

40% Small and mid-sized organizations*

Where AI adds value

Top three areas where respondents believe AI adds maximum value

71%

Operational efficiency

67%

Customer experience

51%
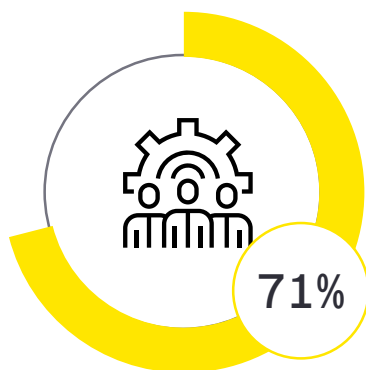
Revenue growth

Large organizations (headcount >3,000 employees) , Small and Mid-sized organisations (headcount <=3,000)

The last few years have witnessed an almost exponential increase in AI-related solutions. Needless to say, this has drawn the attention of CXOs and board members across India, and indeed, across the world.

The EY-NASSCOM CXO survey (hereinafter referred to as Survey) was administered to better understand the experiences and perceptions of industry leaders regarding AI-adoption along with its potential for transforming enterprises and creating long-term value.

> *Our customers see AI as most promising for internal origination of workflows followed by engagement workflows. The challenge is how best to marry these technologies, especially complicated business rules. The AI you are using must be able to exchange inputs and outputs with those rules*
>
> *CXO, an industrial OEM company*

Majority of respondents see AI solving real-world problems and disrupting business models. 60% of respondents believe that AI will disrupt their businesses within the next two to three years. While organizations that have implemented AI have achieved tangible business benefits, current adoption levels are low.

~70%

of enterprises that have deployed AI have achieved measurable benefits

The compounding positive effect of **data** explosion, **digital** transformation, superior **computing** power and democratization of access to **advanced algorithms** has enabled AI discussion to shift beyond academic discourse, to solving real-world business problems.

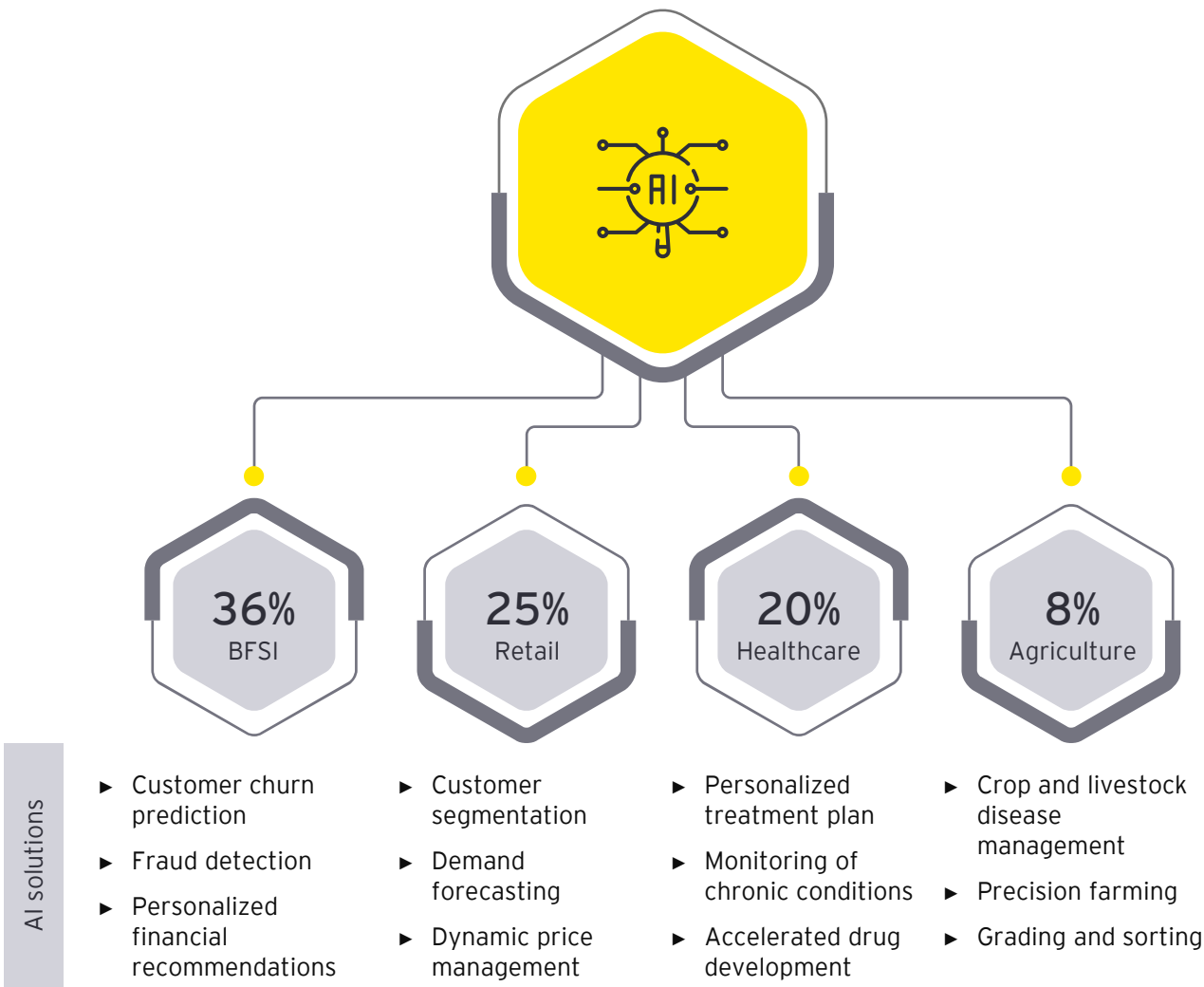The following table highlights key trends impacting the growth of AI within the industry ecosystem in India

	Key trends	Growth/Potential
Exponential data growth	▶ Rise in virtual transactions and evolving customer behaviour have led to growth in data creation ▶ Enterprises looking to monetize data will drive AI adoption	▶ Data usage in India growing at **73% CAGR** ▶ **93%** firms see potential value of data, **47%** already monetizing it
Digital talent	▶ Growing AI talent pool ▶ IT professionals upskilling to gain AI and Machine Learning (ML) skills	▶ **India ranks third** in terms of AI skill penetration globally ▶ **Over 500,000 workers in AI, ML and Analytics** employed in the IT industry
Maturing technology	▶ AI is moving to a realm of distributed and ubiquitous intelligence to enable on-field decisions supported by a centralised cloud-based model ▶ Algorithmic advances and democratization to spur growth of AI systems	▶ **80% of enterprise workloads** to be in Cloud by 2025 ▶ **Cloud-powered AI solutions** to drive productivity, resiliency and profitability
Start-up ecosystem	▶ Rapid growth in new AI-based start-ups ▶ Enterprises and government are collaborating with start-ups to build an ecosystem	▶ **12-15%** growth in number of AI start-ups ▶ **44%** funding growth for AI start-ups
Government initiatives	▶ National strategy for AI released by NITI Aayog in 2018 ▶ India joins Global Partnership on AI (GPAI) to promote responsible and human-centric development and use of AI	▶ Budget of **US$ 1.1 B** allocated for quantum computing and technology ▶ **US$ 450-500 B addition** to India's GDP by 2025 from Data and AI

How have different sectors fared with AI deployment?

The survey results indicate that enterprises across sectors are embracing AI, albeit with varying levels of commitment. Unsurprisingly, sectors which are intensive in terms of recorded or digitized data such as BFSI or retail have taken the lead on AI adoption. However, other sectors are also catching up and have many meaningful AI endeavours at different levels of implementation. Our conversations with these enterprises have revealed several powerful applications of AI across enterprise's value chain.

Fig I: Illustrative sector-pertinent AI deployments

	36% BFSI	25% Retail	20% Healthcare	8% Agriculture
AI solutions	► Customer churn prediction ► Fraud detection ► Personalized financial recommendations	► Customer segmentation ► Demand forecasting ► Dynamic price management	► Personalized treatment plan ► Monitoring of chronic conditions ► Accelerated drug development	► Crop and livestock disease management ► Precision farming ► Grading and sorting

According to our survey results, AI is permeating across businesses, sectors and in many business functions across the value chain.

EY and NASSCOM playbooks discussing use cases across retail, BFSI, healthcare and agriculture sectors are available for in-depth insights.
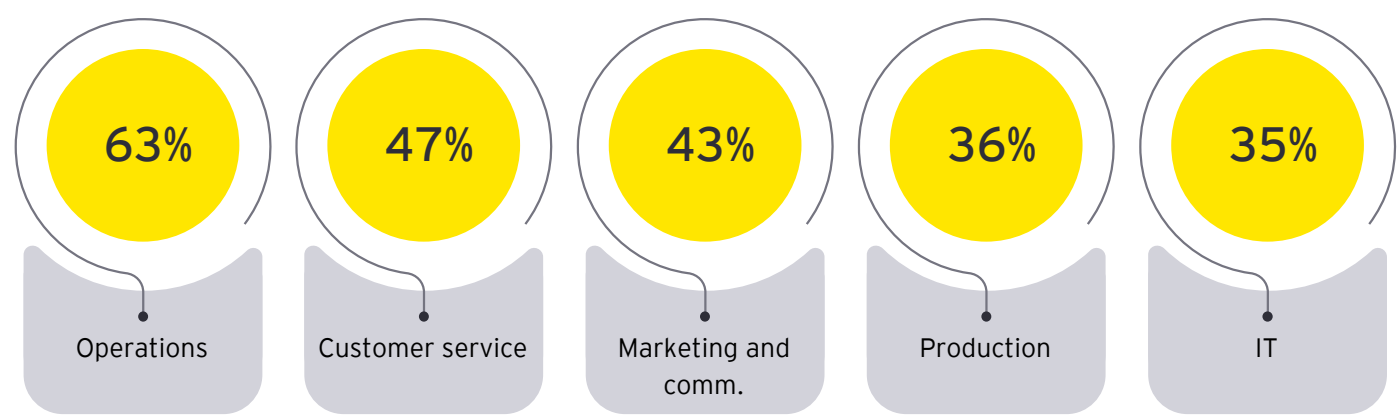
> *There are different lenses to look at AI value. Make sure that you have the right one for you. Different companies do it differently.*
>
> *CXO, an industrial OEM company*

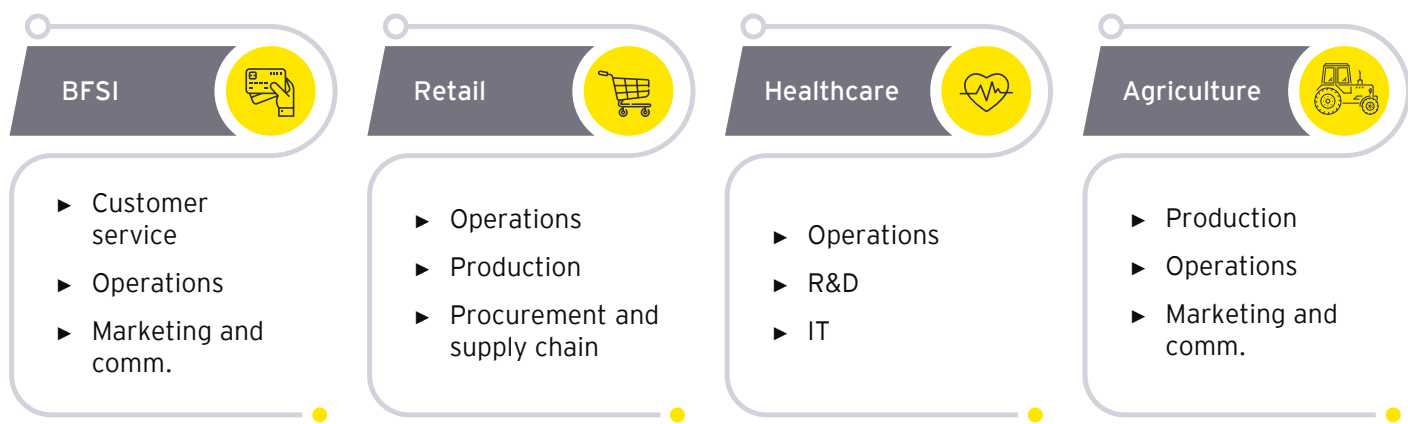**Fig II: Top five functional areas for AI adoption (all respondents)**

63%	47%	43%	36%	35%
Operations	Customer service	Marketing and comm.	Production	IT

Enabling core operations and enhancing customer service/experience are the top beneficiaries of AI technology

Sectoral influences are clearly visible on enterprises' choice of functions for AI deployment (planned and existing). Retail and BFSI sectors favour customer centric functions, whereas business leaders in the healthcare and agricultural sectors believe 'Operations' to be the highest potential area.

Fig III: Top three* functional areas of AI deployment

BFSI	Retail	Healthcare	Agriculture
► Customer service	► Operations	► Operations	► Production
► Operations	► Production	► R&D	► Operations
► Marketing and comm.	► Procurement and supply chain	► IT	► Marketing and comm.

However, enterprises continue to have other emerging areas of interest on their radar. These include accounting and reporting, risk management, research and development, corporate strategy, quality, sales and supply chain for application of AI.
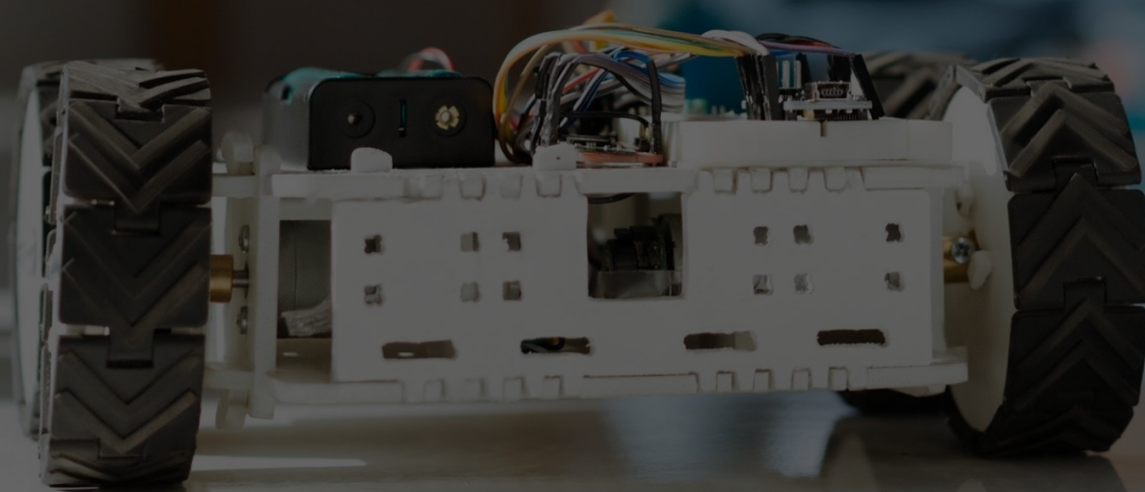
> *Picking the right areas to focus on should be in-line with the organization's priorities and technology limitations.*
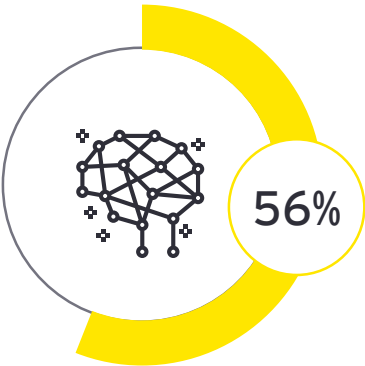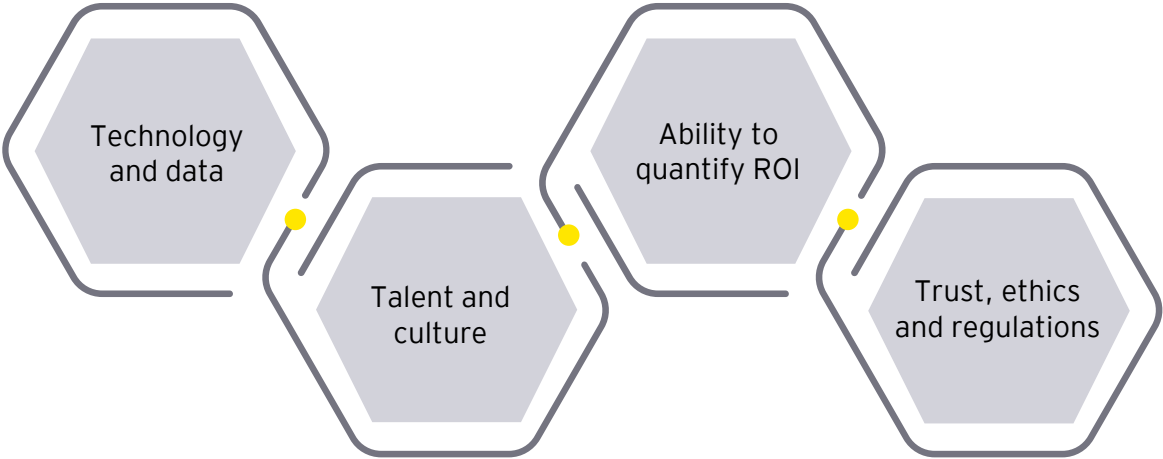>
> *CXO, a global healthcare MNC*

*Areas with more than 40% of deployment across the sector participants
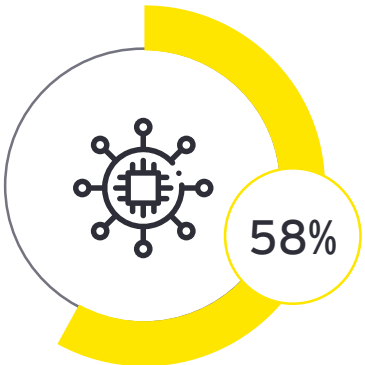
Impediments to AI adoption

2

Technology
and data

Talent and
culture

Ability to
quantify ROI

Trust, ethics
and regulations

56%

of respondents, that have **deployed AI,** believe that the biggest challenge is
low maturity of the external ecosystem

58%

of the organizations that have **not implemented AI** believe that a low
level of enterprise digitization is holding them back

While the **ability to quantify ROI** is a key roadblock in the adoption of AI, ensuring **trust** through **explainability,**
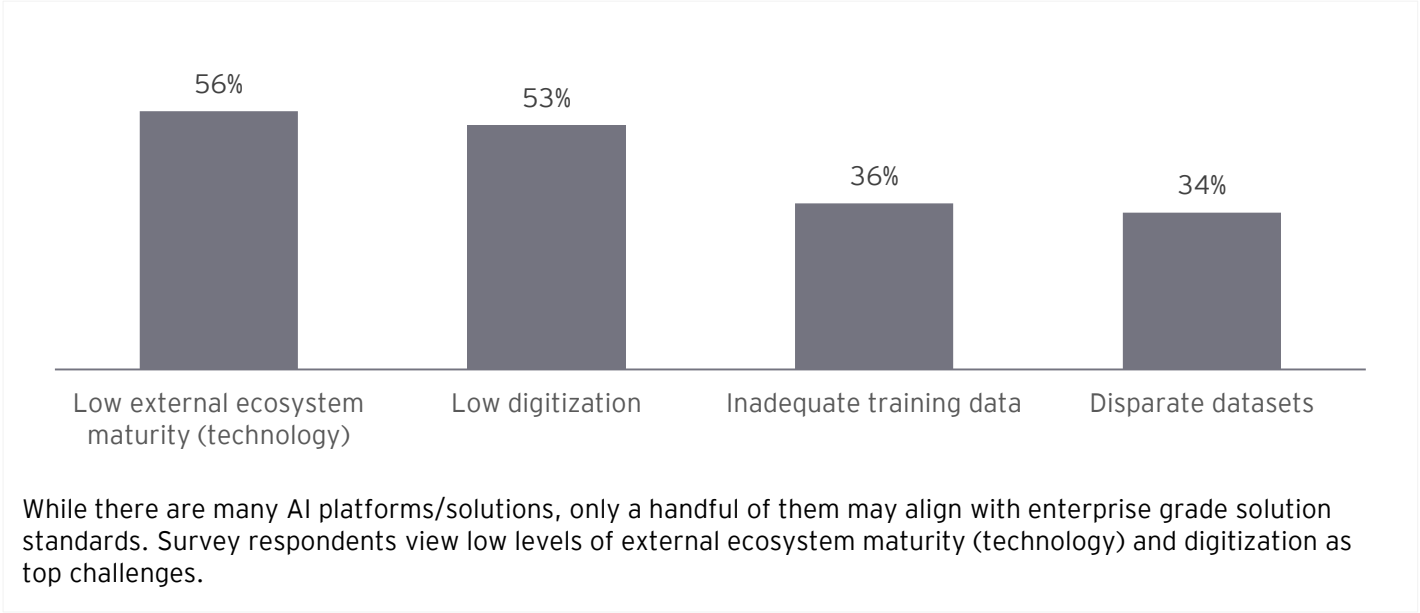**accountability** and **ethical use** are also the major concerns for wider adoption

AI has something for everybody. But this has done little for organizations that are yet to embark on this journey. One of the key aspects of the survey was to understand what was holding back such organizations from adopting AI.

Fig IV: Not knowing the 'Art of Possible'

> *We are investing in modern infrastructure to ensure that all the data is stored in one place since we had lots of legacy systems that hindered data consolidation.*
>
> *CXO, a leading dental laboratory company*

1. Technology and data

Fig V: Technology and data challenges (all respondents)

Low external ecosystem maturity (technology)	Low digitization	Inadequate training data	Disparate datasets
56%	53%	36%	34%

While there are many AI platforms/solutions, only a handful of them may align with enterprise grade solution standards. Survey respondents view low levels of external ecosystem maturity (technology) and digitization as top challenges.

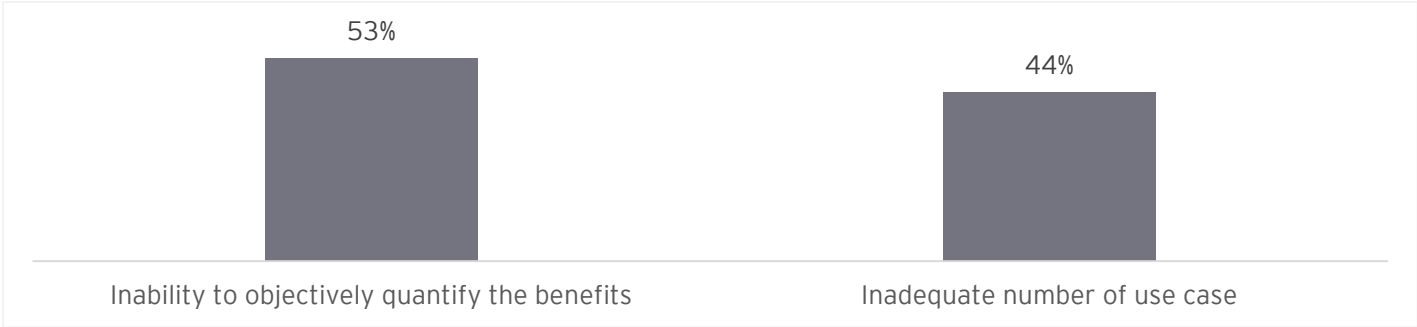**Enterprises that have not deployed AI**

58% believe that **low digitization** is holding them back on AI adoption

Enterprises that have deployed AI

36% have faced challenges with low digitization

2. Ability to quantify ROI

Fig VI: Key factors impacting the ROI quantification (all respondents)

| 53%	44%
Inability to objectively quantify the benefits	Inadequate number of use case

► Majority of respondents expressed the inability to quantify the benefits of AI, which hindered wider adoption

► Another challenges was the inability to identify appropriate and relevant AI use cases

Enterprises that have not deployed AI

47% believe that **unavailability of use cases** is a major challenge

Enterprises that have deployed AI

34% reported the unavailability of use cases as a challenge

3. Talent and culture

Fig VII: Workforce challenges that worry CXOs the most (all respondents)

40%	38%	33%
Talent Shortage	Cultural or behavioral impediments	Workforce displacement
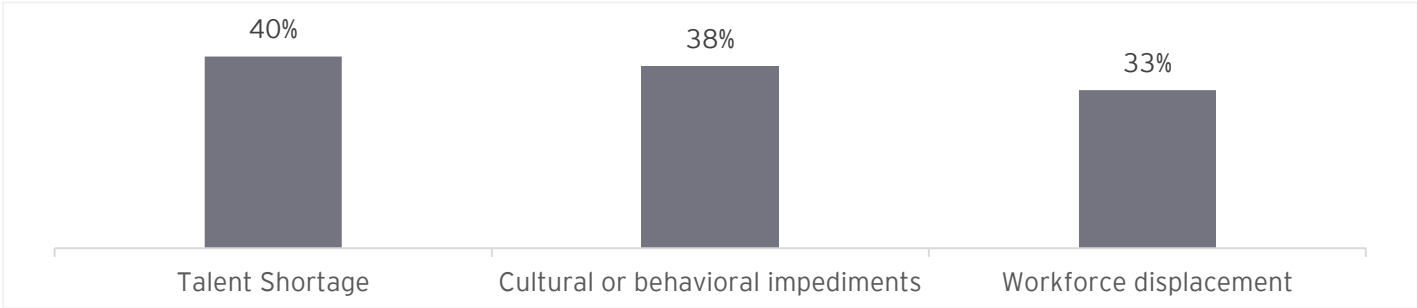
Both corporate and government leaders have been concerned about the prospect of job losses owing to AI adoption. However, our study suggest a close interplay between people and technology in companies where AI has added value. In this regard, a shortage of adequate skills and the lack of willingness to change are seen as major obstacles.

Enterprises that have not deployed AI

~ **32%** perceive **cultural and behavioural impediments** as a challenge to AI adoption

Enterprises that have deployed AI

55% indicate cultural or behavioral impediments as a challenge

Enterprises that have not deployed AI

40% perceive workforce displacement as a likely cause for resistance to AI adoption

Enterprises that have deployed AI

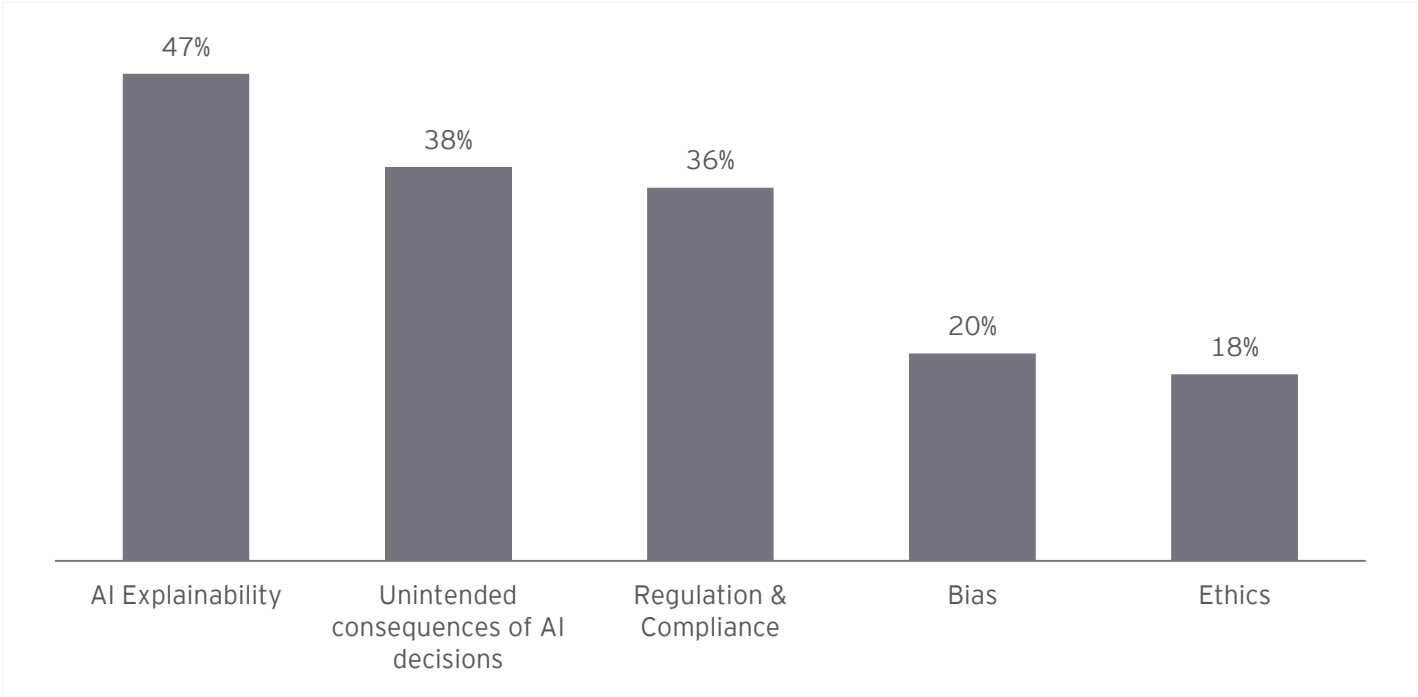**19%** indicate workforce displacement as a risk

> " *Erosion of trust will only happen if you don't keep people informed and if they're forming opinions about AI in a vacuum.*
>
> *CXO, an Indian Hospital chain*

4. Trust, ethics and regulations

Fig VIII: Trust, ethics and regulations related concerns of CXOs (all respondents)

Bar chart:
- AI Explainability: 47%
- Unintended consequences of AI decisions: 38%
- Regulation & Compliance: 36%
- Bias: 20%
- Ethics: 18%

► The study revealed that maintaining user trust and ensuring ethical use of AI are seen as key imperatives for AI adoption

► Safety, security and privacy risks, along with their impact on brand-reputation, are key considerations when evaluating AI programs

► Explainability is a critical consideration when AI is being evaluated as a decision making tool

► AI governance and risk management considerations need a lot more focus and oversight in order to build stakeholder trust

Enterprises that have not deployed AI

Data security, privacy, brand reputation, and **safety/security of people and equipment** are top-of-mind concerns

Enterprises that have deployed AI

AI explainability and **bias** is identified to be among the **top risks**

> *Ethics and governance are very important. Having a formal ethics policy as it relates to AI is a top priority for our company, and it is in the pipeline*
>
> *CXO, a retail MNC*

Enhancing AI maturity

3

As enterprises look to determine the *What* and *How* of AI, it is important to baseline their current level of preparedness and maturity.
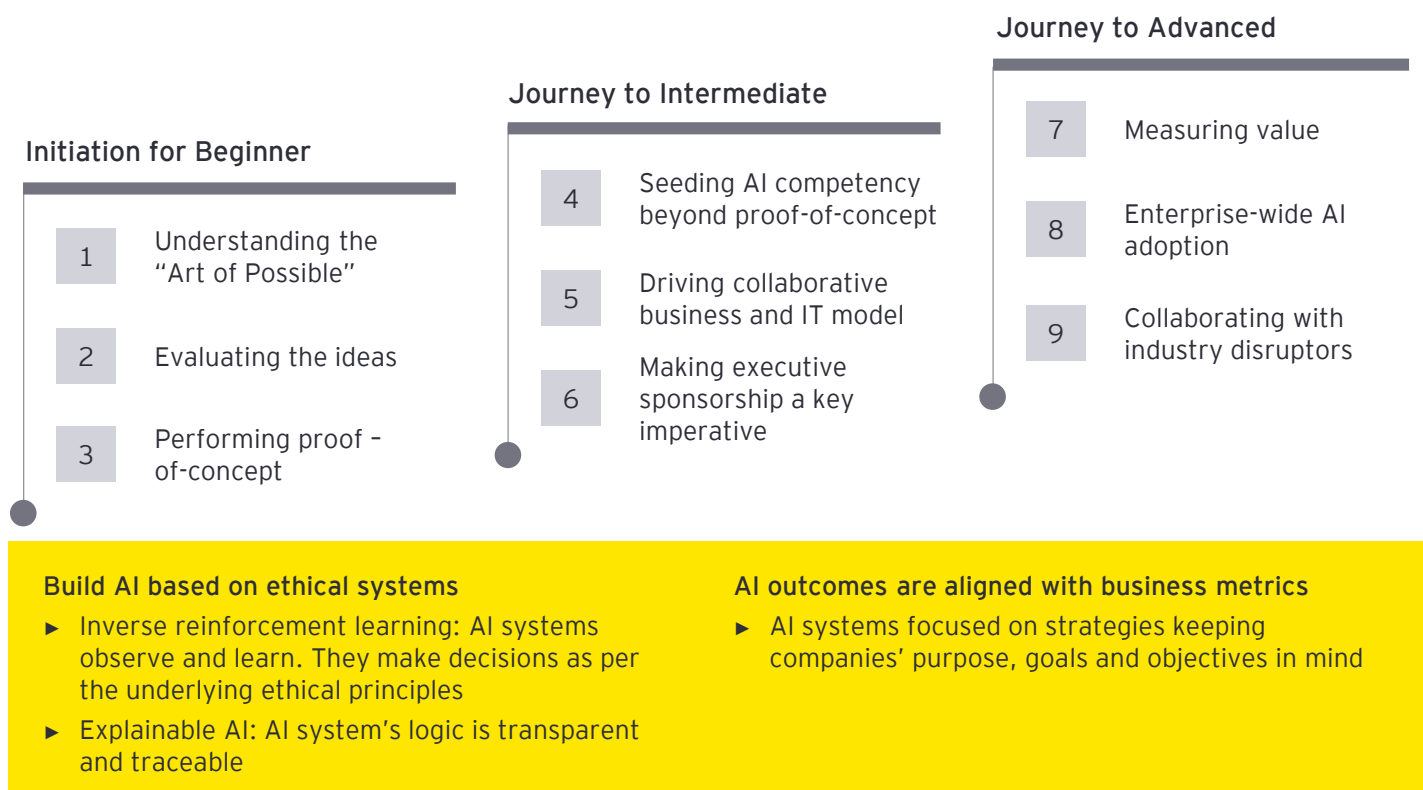
The AI maturity model has eight dimensions as shown below and it allows organizations to map themselves against three levels of AI maturity.

The AI maturity levels discussed below could be a useful starting point. Its aim is to provide enterprises a frame of reference for their current-state maturity and suggest a roadmap for their long-term AI journey.

Fig IX: Dimensions of AI maturity model

Fig X: Roadmap for moving up the AI maturity levels

Initiation for Beginner

1. Understanding the "Art of Possible"
2. Evaluating the ideas
3. Performing proof – of-concept

Journey to Intermediate

4. Seeding AI competency beyond proof-of-concept
5. Driving collaborative business and IT model
6. Making executive sponsorship a key imperative

Journey to Advanced

7. Measuring value
8. Enterprise-wide AI adoption
9. Collaborating with industry disruptors

Build AI based on ethical systems
- ► Inverse reinforcement learning: AI systems observe and learn. They make decisions as per the underlying ethical principles
- ► Explainable AI: AI system's logic is transparent and traceable

AI outcomes are aligned with business metrics
- ► AI systems focused on strategies keeping companies' purpose, goals and objectives in mind

1. Understanding the "Art of Possible"

▶ Understanding what AI can offer to businesses and functions is a pre-requisite to starting the AI journey

▶ It allows for various stakeholders to have a common understanding of the purpose, and goals of AI

> " *Innovation budgets are spent based on highest ROI. Having said that, we are not implementing AI for the sake of it. While we encourage people to try out new technologies, there needs to be a business outcome.*
>
> *CXO, a technology provider*

2. Evaluating the ideas   ## 3. Performing proof-of-concept (POC)

Top down

Identify business problems with an intelligence gap

Identify an AI technology

Measure the value of a perfect solution

Look for business problems to solve

Determine "how good is good enough" to get the most value

Measure the value a solution might deliver

Assess technical feasibility

Experiment to determine what value can be generated

Bottom up
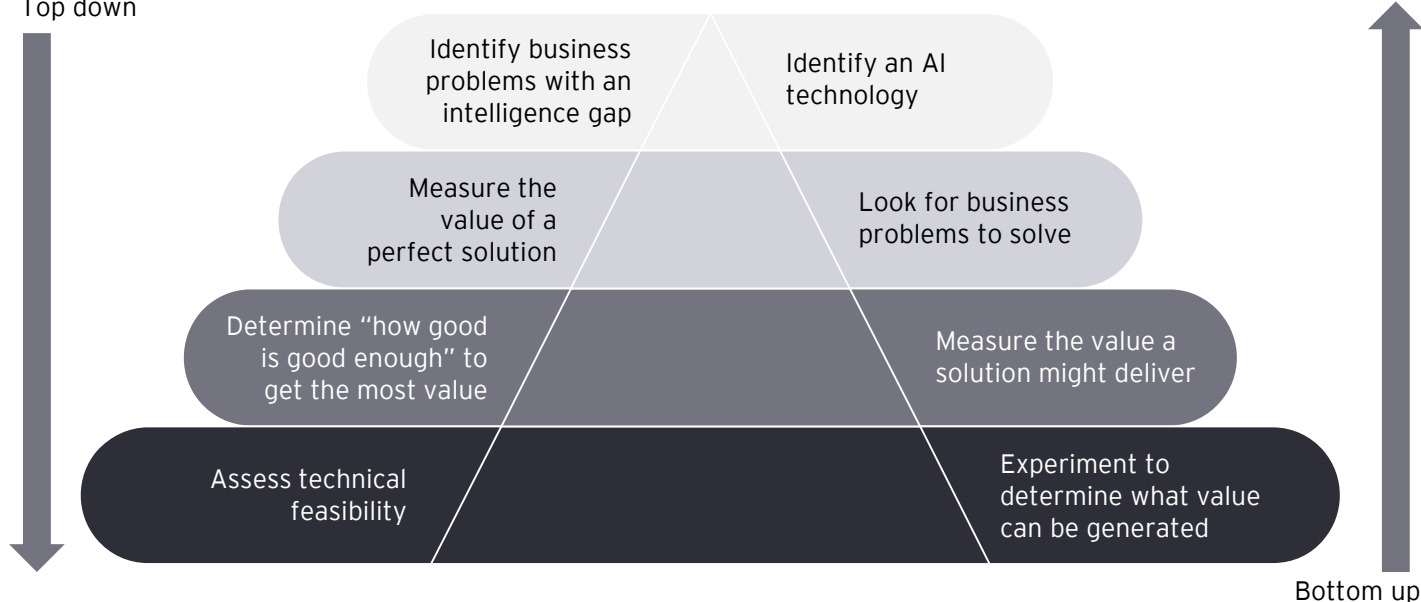
4. Seeding AI competency beyond proof-of-concept

▶ Building AI competency is key to scaling the program beyond a proof-of-concept

▶ While organizations do well by tapping into the ecosystem of advisors and technologists, a strong understanding and capability within the organization could go a long way in delivering a sustainable AI-led transformation

▶ In this regard, our survey results indicate that internal re-skilling is the most favoured talent strategy

5. Driving collaborative business and IT models

▶ Have joint ownership of AI initiatives, with business providing the domain understanding and IT driving the technological aspects

▶ Jointly address AI-specific risks and biases

▶ Jointly plan and build the organization's skilling and re-skilling requirements

6. Making executive sponsorship a key imperative

► Include AI adoption imperatives in strategy discussions with the board

► Have a C-suite sponsor to increase visibility and acceptance

7. Measuring value

► Focus on proof-of-value during wider adoption

► Select use-cases based on envisaged business outcomes (e.g., revenue impact, customer experience, profitability improvement, productivity enhancement and risk management)

8. Enterprise-wide AI adoption

► Encourage cross-functional participation

► Focus on governance, skills, data, culture and communications to enhance enterprise-wide alignment of AI program objectives

9. Collaborating with industry disruptors

► Collaborate through open dialogue with technology providers, advisors and start-ups to build industry-leading AI capabilities

> "
> *We have established a strategic partnership with a leading cloud platform service provider. Their AI platform would help us build foundational technologies and enable us to use AI effectively.*
>
> CXO, a pharmaceutical company
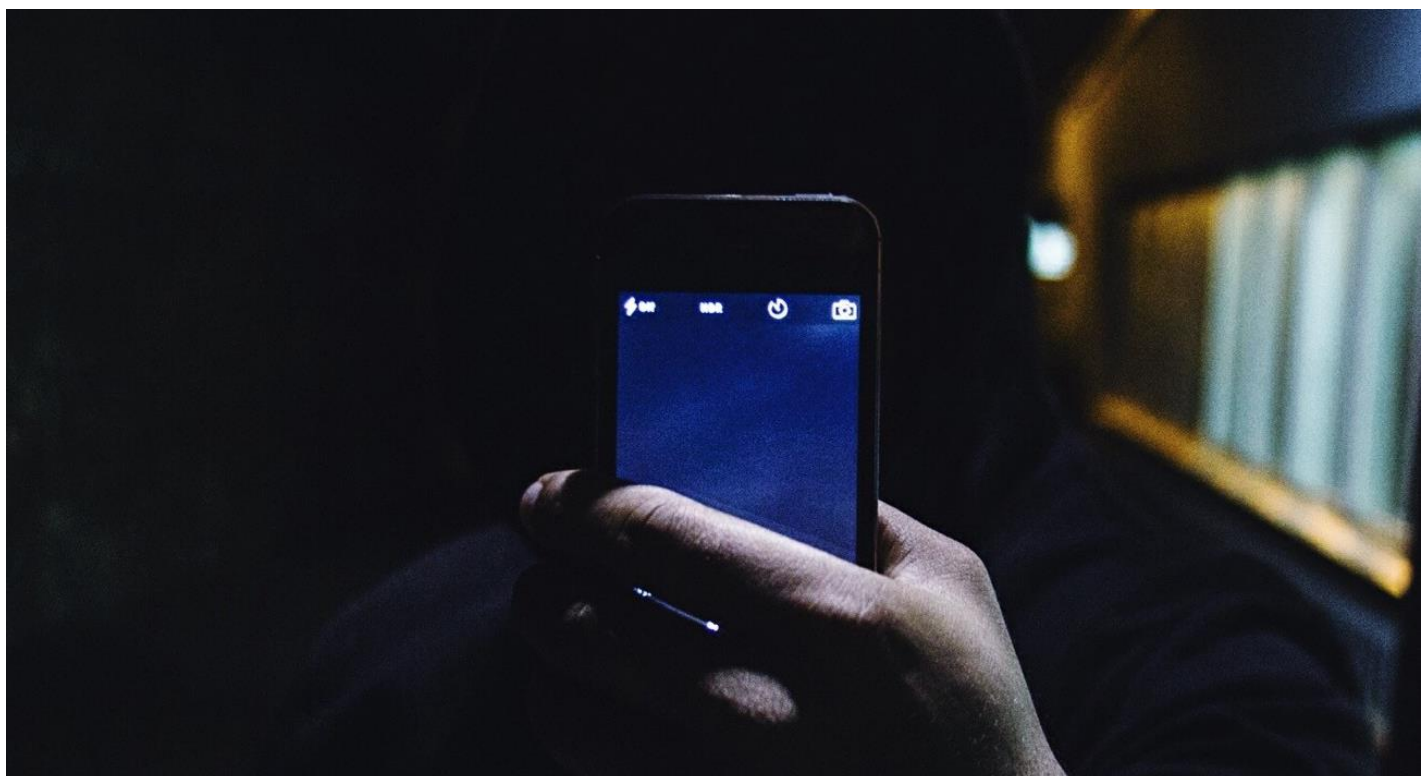
Making it happen

4

While the nature and intensity of challenges facing AI initiatives may vary, some key principles and methods can enable companies to enhance AI adoption, increase trust in AI systems, thereby generating long-term value.

Fig XI: AI enablers in enterprises
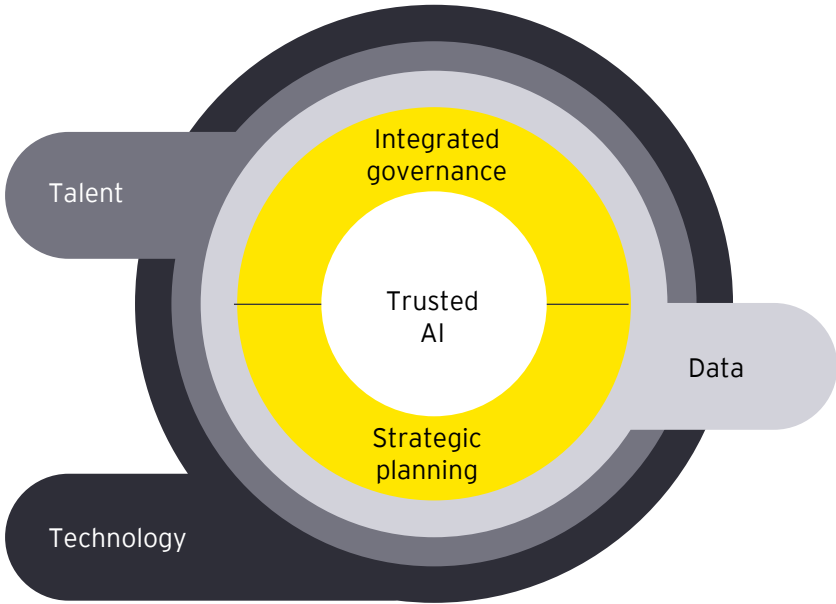
A mutually reinforcing combination of:

► Bringing together required resources through strategic planning and investments from the highest levels of the organization

► Integrated governance including robust practices around data security and privacy

Fig XII: Trust plays a critical role in AI-led decision making

32%
use people to augment
AI decisions

32%
trust AI for operational
decisions only

25%
trust AI for all
operational and strategic

AI-led
Decision
Making
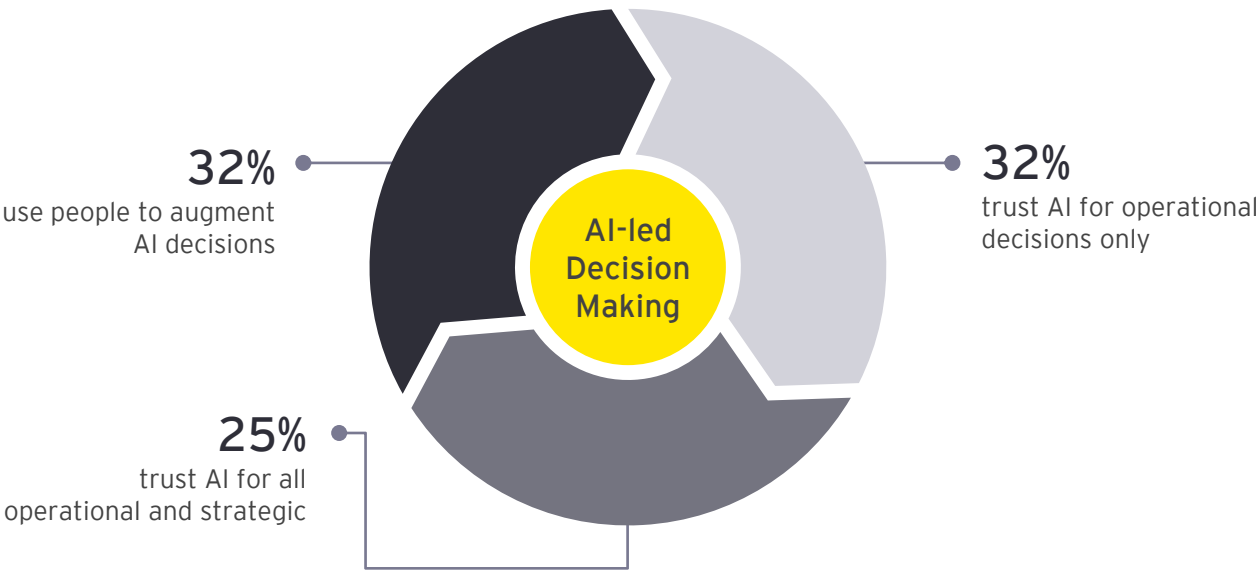
Trust is the lynchpin to enterprise-wide AI adoption. While 57% of the respondents state that they trust AI to make operational and/or strategic decisions, 11% stated that they do not trust AI to make any decisions.

According to our survey, 74% of enterprises have established either a formal strategy or obtained C-suite sponsorship to initiate or scale-up their AI programs. Strategic planning helps to integrate the key levers of talent, technology and data with a company's business objectives to help justify AI program investments.

The majority (72%) of respondents believe that incremental changes to their underlying technology infrastructure may be sufficient for AI adoption.

While talent is seen as a critical success factor, re-skilling of the existing talent pool is stated as the most preferred strategy by majority (78%) of respondents. This enables companies to leverage the combination of newer skills that build on existing organisational knowledge.

Fig XIII: Extent of change required in technology infrastructure

8%
Significant overhaul

20%
No/ limited change

72%
Incremental changes
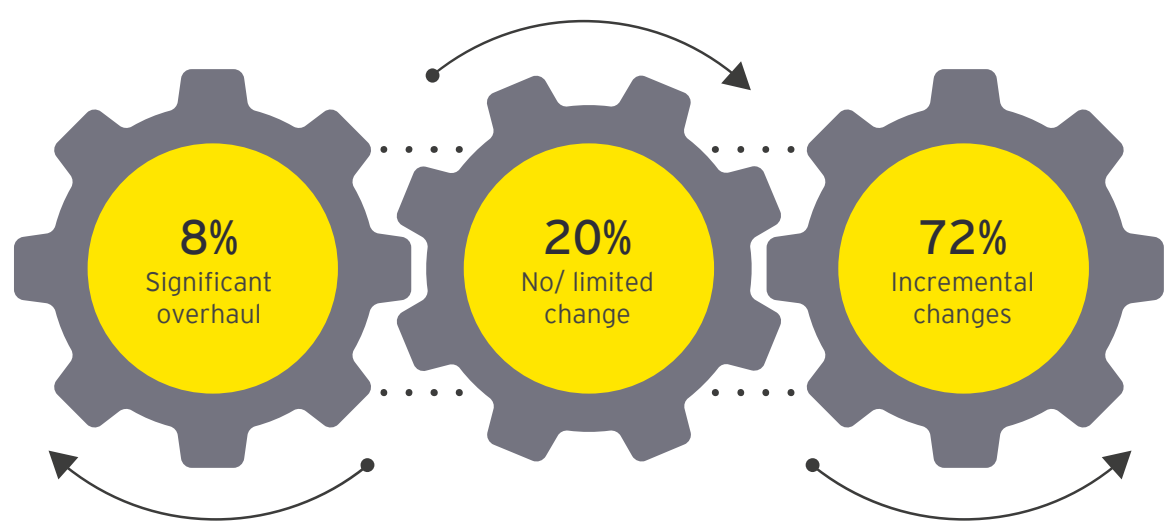
Fig XIV: Preferred talent strategy

1 Reskilling existing talent

2 Acquiring new talent

3 Rightsizing the organization

4 Leveraging 3rd party
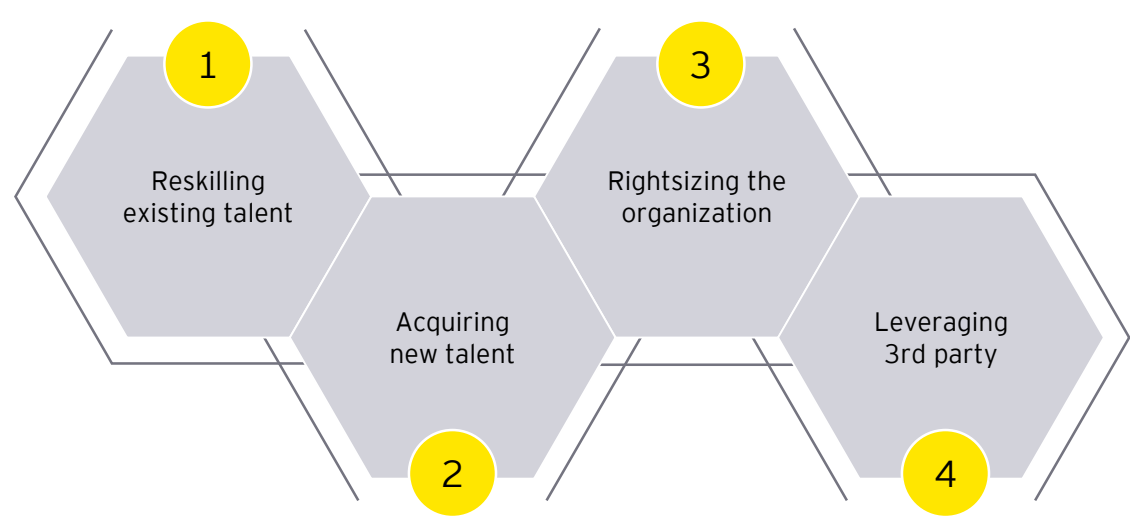
Integrated governance

AI needs to be understandable, auditable and grounded on reliable data. Integrated governance is needed to promote reliability of data gathering, storage and its usage, with adequate safeguards built-in through a robust risk management framework.

Almost half of the surveyed enterprises state that their data strategy, specifically as it relates to harmonizing data from disparate datasets and strengthening data security, has significant scope for improvement to ensure AI-program success.

Fig XV: Dimensions for effective data strategy

Data
security

Data
Harmonization

Data
Privacy
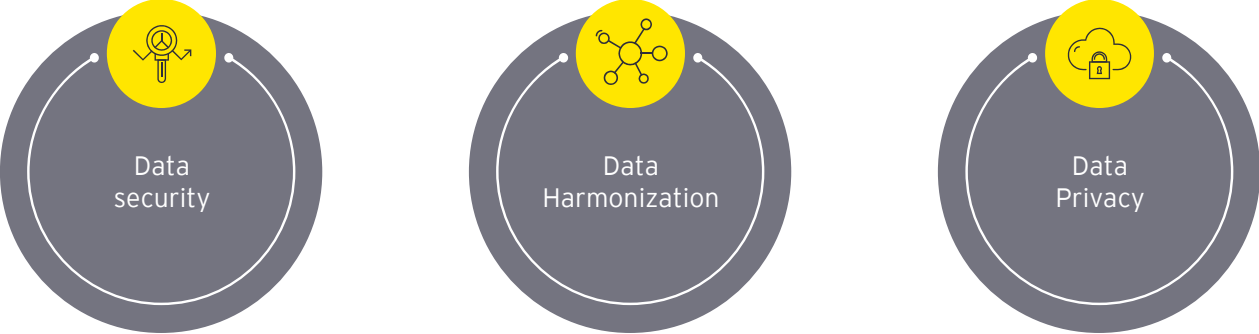
88% of the respondents indicate the need to establish/improve their risk management practices to address AI-specific concerns around ethics and biased outcomes.

Fig XVI: Robustness of risk management framework

12%	69%	19%
Strong and robust policies in place	Adequate but can improve	Not adequate enough
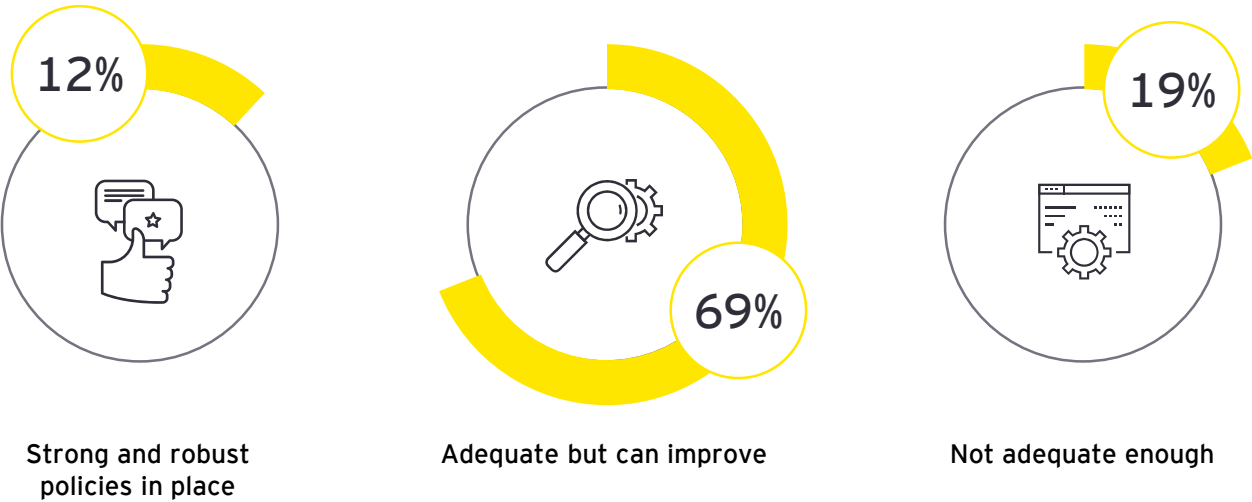
Modernizing existing technology infrastructure and creating a single view of data is a top priority for enterprises to scale their AI implementations

CXO, a retail MNC

Looking
ahead

5

As acknowledged by an overwhelming majority of the CXOs who participated in this survey, AI holds tremendous potential for helping companies innovate, enhance competitiveness and generate significant long-term value.

Several AI adopters have already achieved remarkable success* in transforming their business models, operational processes and customer/employee experiences.

Indeed, the benefits of AI are real and sustainable. As business leaders continue to push the frontiers of technology and embrace additional use cases of AI, the 'Art of Possible' will be limited only by our imagination and our desire to innovate.

However, sustaining the AI advantage requires organizations to address challenges related to talent, data, technology and governance, including critical aspects related to AI ethics, accountability and explainability. Doing so, will enable business leaders to build stakeholder trust and rapidly scale their AI programs.

*Please refer to NASSCOM-EY sector specific playbooks for further guidance on industry use cases

About the report

This report is based on responses from over 500+ CXOs who participated in our survey which was conducted during the period January to March 2020. The survey respondents were largely the CEOs and CIOs from large and mid-sized companies across India. We also conducted in-depth interviews with a cross-section of Industry leaders representing multiple sectors.

The majority of our survey respondents represented sectors such as retail (21%), BFSI (24%), healthcare (23%) and agriculture (16%), along with AI ecosystem partners such as start-ups and Global capability centres (16%).

The findings from the study can be leveraged by boards, corporate executives and government leaders interested in accelerating AI-adoption across enterprises in India.

Acknowledgement

We would like to thank the survey participants and industry leaders for their time and valuable insights that helped us develop this report.

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