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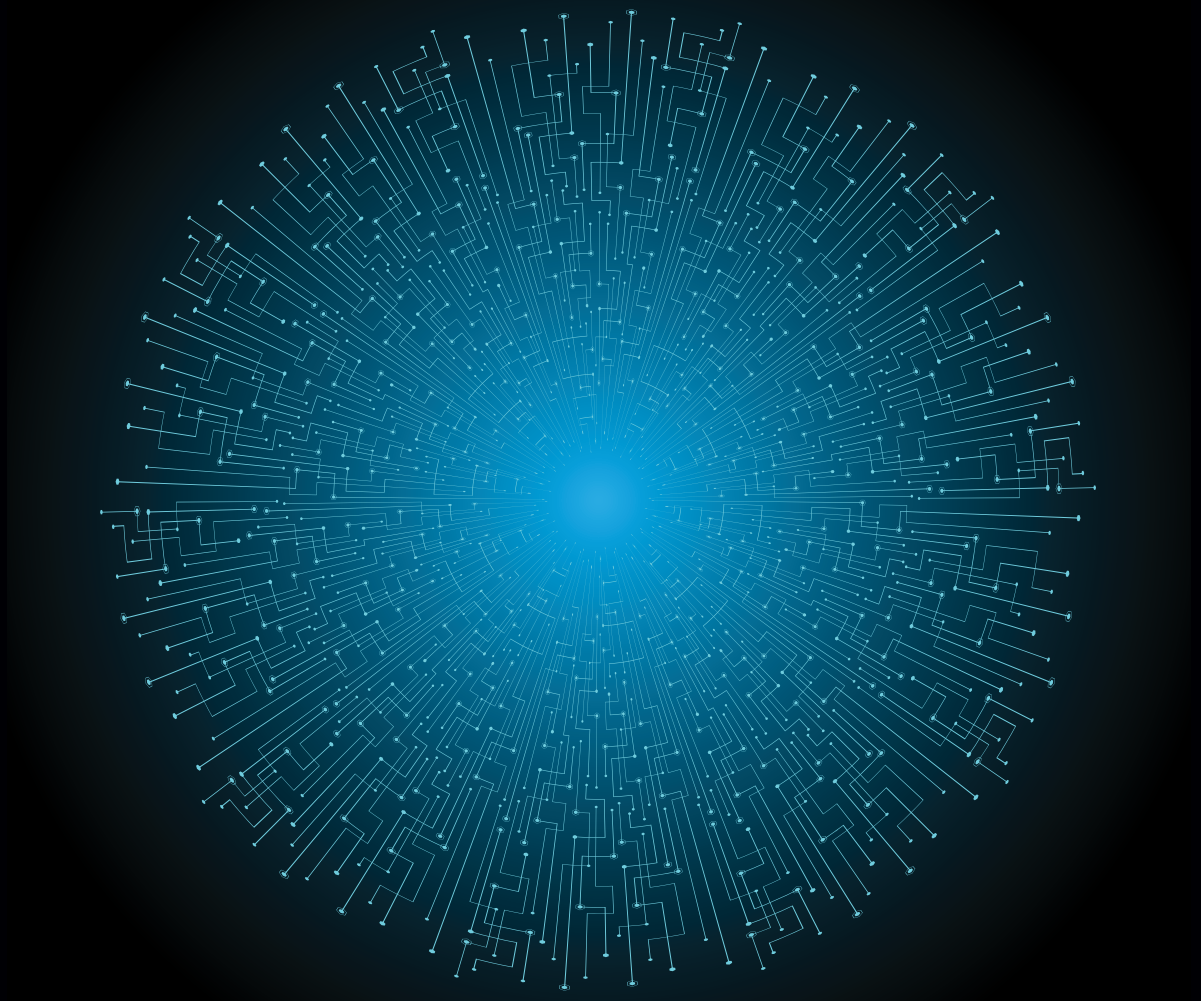
Confederation of Indian Industry



The "Age of With™": Humans and machines

Future of Artificial Intelligence

Contents

We are now in the "Age of With™," where companies are harnessing the power of human intelligence with machine intelligence to identify unique advantages through analytics and Artificial Intelligence (AI).

Foreword from CII

We are in the "Age of With™", where human-machine partnerships will not only help automate and co-ordinate our lives, but also transform how organisations find talent, manage teams, deliver products and services, and support professional development. It is becoming increasingly important for humans and machines to work together as a cohesive workforce, and Indian leaders are better aligned with this concept when compared with their regional and global counterparts.

Organisations are using digital twin capabilities in a variety of ways. In sectors such as automotive, aviation, agriculture, education, energy, and health care, digital twin capabilities are optimising value chains and innovating new products. Digital twins can simulate aspects of a physical object or process and represent the engineering drawings or the subcomponents and corresponding lineage of a new product in the broader supply chain—from the design table to the consumer. Digital twins may take many forms, but they all capture and utilise data that represents the physical world.

Two of the biggest benefits that supply chains can take from digitising their processes are speed and cost. Taking your operations to the next technological level can significantly cut the time to make strategic decisions, whilst also boosting operational efficiency. During COVID-19, countless supply chains were crippled around the world due to their outdated systems. Traceability can fall apart when certain aspects of the network have to close due to unforeseen reasons.

Industry 4.0 or the fourth industrial revolution revolves around the idea that connectivity, automation technologies, and digitisation will propel the fourth major revolution in manufacturing. With trends such as using IoT to collect machine data and enable predictive maintenance and 3D printing; and robots, cobots on the factory floor, the Industry 4.0 market is projected to reach almost US$157 billion by 2024.

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Foreword by Deloitte

Artificial Intelligence has arrived at the junction where humans collaborate with machines—the "Age of With™"—in more ways than ever.

Innovating better customer experiences, reimagining processes with greater efficiency, and arriving and acting on insights with speed and precision, AI is enhancing organisational resilience in volatile, dynamic, and unpredictable marketplaces, while optimising performance for growth.

While technology is the fuel for this age, AI is more than a technology, which is why, organisations need qualified resources to tie in the broader mix of capabilities and experiences and achieve its full potential while avoiding the drawbacks.

In the Age of With™, organisations are able to predict possibilities, generate insights on performance drivers, and then translate them into reliable actions. A recent survey by Deloitte of over 2,700 executives found that:

- AI provided organisations with a competitive advantage, and
- most organisations aim to harness its power on a broader level and increase investments across AI implementations.

We believe that the growth rate of AI is unmatched in the country and that the organisations attempting to adopt AI are eyeing a significant competitive advantage.

This report is a comprehensive AI strategy framework that demonstrates how AI can generate value for organisations. This has been done by highlighting the state of play in the AI market and the way organisations are transitioning from AI experimentation to full-scale implementation. The report also provides insights on transforming into an AI-fuelled organisation, along with the challenges and issues that could arise out of such adoption, while briefly touching on the ethical dilemmas and the framework to address them.

Prashanth Kaddi
Partner

Welcome to the Age of With™: Humans and machines

Turning possibility into performance

Artificial Intelligence has come of age. The “Age of With™,” where humans and machines work together, is upon us. Our ability to connect, collaborate, and innovate is creating remarkable new possibilities for businesses and the society, at large.

And though AI has become ubiquitous in many ways—guiding strategies, improving processes, shaping business models, rethinking customer experiences, and even finding cures—we are only scratching the surface of what it can do. The power of automation and AI lies in re-imagining the way we do things. But that can only happen when organisations ready themselves to absorb and adopt these new technologies.

Societies are realising the benefits that humans can reap with machines: scaling with speed, data with understanding, decisions with confidence, outcomes with accountability. The amplifying, clarifying power of **with** is here for taking.

A future where humans are aided, enhanced, augmented by AI and an age of digital–human symbiosis: The “Age of With™.”

“With” is an idea that works on multiple levels

With is shorthand for the advantages as an outcome of:

Humans with machines

AI empowers human- machine collaboration and helps draw insights from massive data sets faster and automate processes more intelligently. Through AI, organisations become far more predictive and innovative.

Connection

AI delivers connections in many ways—front office with back office, invention with consumer needs, IoT data with client-owned data, and intention with outcomes. Such connectivity is vital for performance.

Collaboration

AI enables collaboration between people and data, processes, products, suppliers, and customers. Through AI, process can creatively work together and with efficiency.

The AI strategy framework

A comprehensive AI strategy framework will help envision ways in which AI initiatives can generate value, transform the tech architecture, evolve the workforce, and create trust for organisations.

Value

Organisations need to understand and envision ways where AI can transform the enterprise and quantify the value that can be derived from AI, based on investment returns and strategic priorities.

Organisations can identify ways to generate sustained competitive advantage, create and capture shifting value pools, achieve profitable growth, and transform the nature and execution of their work. A top-level and future-ready AI strategy and execution plan to scale across business units is necessary for organisations to gain a competitive advantage.

Architecture

Organisations must understand the required enterprise architecture and technologies that are needed to demonstrate the technical feasibility of AI and enable their AI vision and scale.

To demonstrate the technical feasibility of enabling the AI vision, organisations should establish the required architecture for AI/ML, data strategy and technologies, various Proof of Concepts (PoCs), vendors and ecosystems.

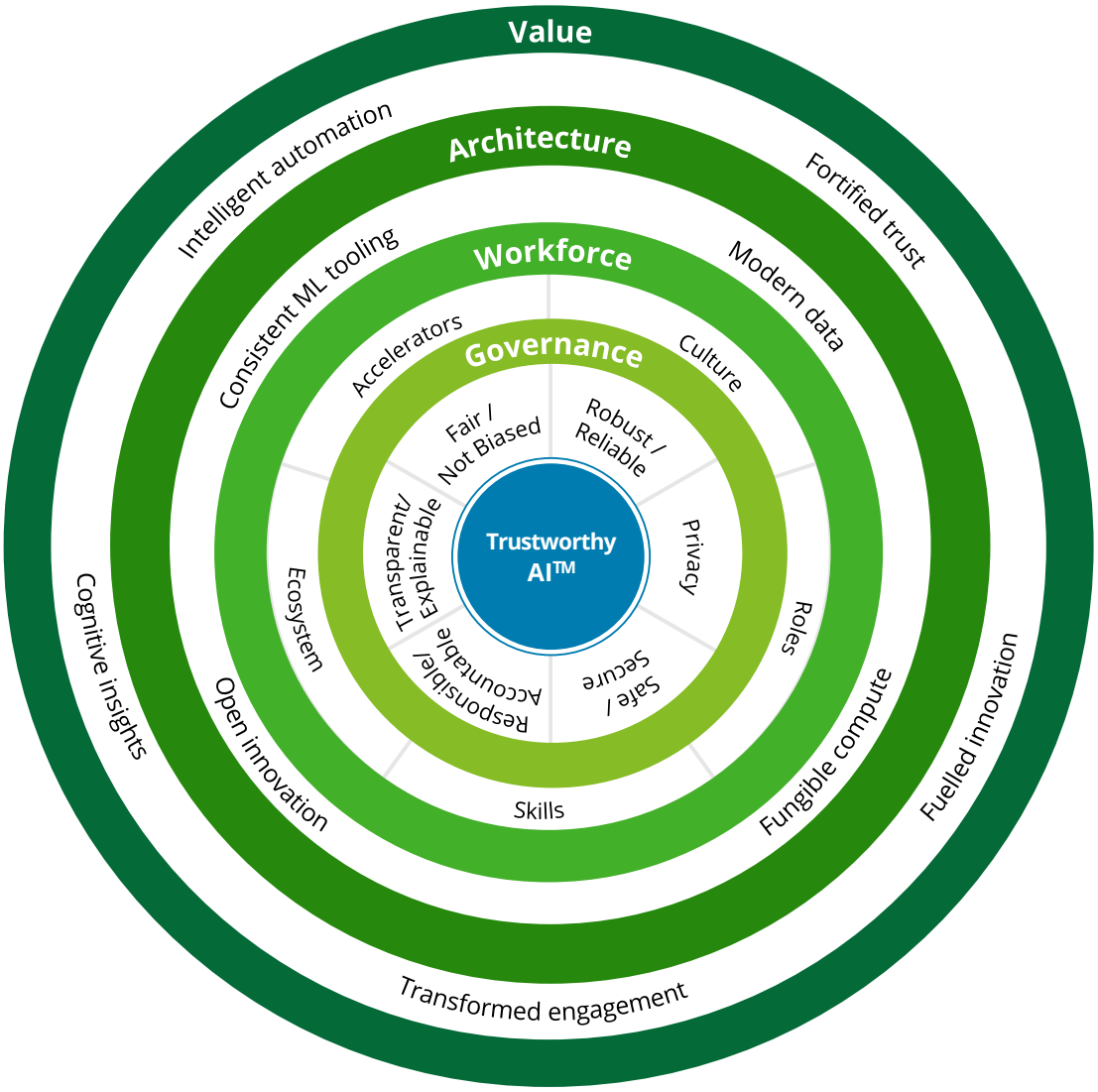
Workforce

To work with AI, organisations need to evaluate existing skillsets and operating models and identify a path to close skill gaps, including establishing a Centre of Excellence (CoE) and ecosystem partnerships.

Businesses need to configure their operating model to support accelerated AI adoption, realign existing capabilities, acquire the necessary skills to operate, and manage human and machine workflow integration. This also includes identifying the organisational structure and capabilities to support the management and development of AI across different business units.

Governance

Aligning ethical AI priorities and establishing a control and governance framework is a key step towards AI adoption. It is a means to oversee AI applications and mitigate regulatory and legal risks without stifling innovation. Organisations need to develop risk controls and establish an effective governance framework and processes to maintain ethical standards.



State of play in the AI market

Many companies are moving from experimenting with AI to implementing at scale

Market highlights

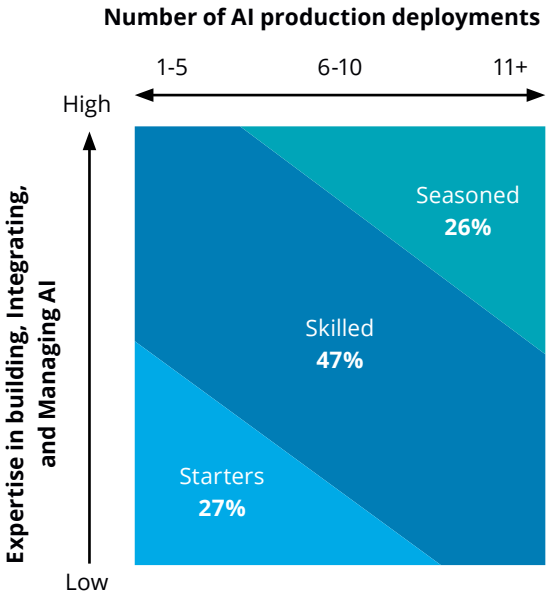
The current market scenario shows that easy-to-use, cloud-based AI tools and AI-equipped enterprise software are becoming popular for organisation-wide AI adoption. Organisations are using AI to improve efficiency, while those adopting AI at scale are harnessing technologies to boost differentiation.

Amongst the top functions for AI application within organisations are IT, cybersecurity, production and manufacturing, and engineering and product development. Although the journey does add value, its significance can be realised when enterprises become AI-fuelled organisations.

Per Deloitte's report, State of AI in the Enterprise (third edition), organisations can be classified into three segments: Seasoned, skilled, and starters. These segments are formed based on the number of AI production deployments undertaken and measures undertaken, such as maturity shown in adopting new technologies, identifying use cases, staffing, and governance.

Source: State of AI in the Enterprise, 3rd Edition: https://www2.deloitte.com/cn/en/pages/about-deloitte/articles/state-of-ai-in-the-enterprise-3rd-edition.html

Seasoned: Seasoned organisations are setting the pace in AI adoption maturity. They have taken a large number of AI production deployments and developed deep AI expertise across the board in selecting AI technologies and suppliers, use case identification, automating business processes, and managing AI talent within the organisation. Seasoned or "AI-fuelled" organisations are deriving high growth value out of AI initiatives by adopting AI at an enterprise scale and moving towards insight-driven decision making and autonomous intelligence.



Source: State of AI in the Enterprise, 3rd Edition. Surveyed more than 2700 executives across different regions.

Skilled: These organisations have launched multiple production AI deployments but are not as AI mature as seasoned organisations. Per the study, a majority of the organisations in the current market state come under the skilled segment. Skilled organisations generally lag in the number of AI system implementations across functions or the level of maturity shown in the implementations. Skilled organisations are in the stage of implementing high-impact "AI at scale", defining use cases for various functional units and establishing governance for large-scale AI deployments.

Starters: Starter organisations have just begun adopting AI in their business units and are yet to develop proficiency in building, integrating and managing AI solutions. These organisations are on the experimentation stage and have siloed applications of AI capabilities; building expertise and executing data-modernisation initiatives.

Being an insight-driven and an AI-fuelled organisation is a result of multidimensional factors. For organisations to utilise embed the insights they derive into decisions, a combination of three drivers is needed: Data and tools, talent, and culture. It is clear that adopters are dedicating large amounts of energy and financial resources towards their AI implementations. As a result of their AI solution deployments, they are able to establish a significant advantage over their competitors.

The potential benefits are significant—greater speed, more precision and accuracy, new and richer data enabling better decisions, and increased workforce capacity that frees workers to focus on high-level, fulfilling, and value-added tasks. A majority of organisations believe that AI will substantially transform both their business and respective industry in the next three years. As an increasing number of organisations are on the path of AI adoption, the early mover advantage of adopting AI is closing fast.

AI technology trends

Democratised Machine Learning (ML) tools: These tools are prebuilt API-based AI algorithms and applications that organisations use to automate the AI solution's development and deployment. Reduced solution development time helps companies focus on customers and their products.

MLOps: MLOps helps in speedy and agile delivery of value as well as streamlined data management, with business decision making support for continued value realisation. MLOps includes data pipeline orchestration, data science model management, automated testing, and automated deployment.

Conversational AI: Conversational AI makes it easier for customers to get in touch with companies and radically shift voice traffic to digital solutions, improving the resolution rate, efficiency, and resilience. Organisations can identify customer intent, auto resolve incoming requests, and/or complement virtual agent capabilities built as part of the existing strategy.

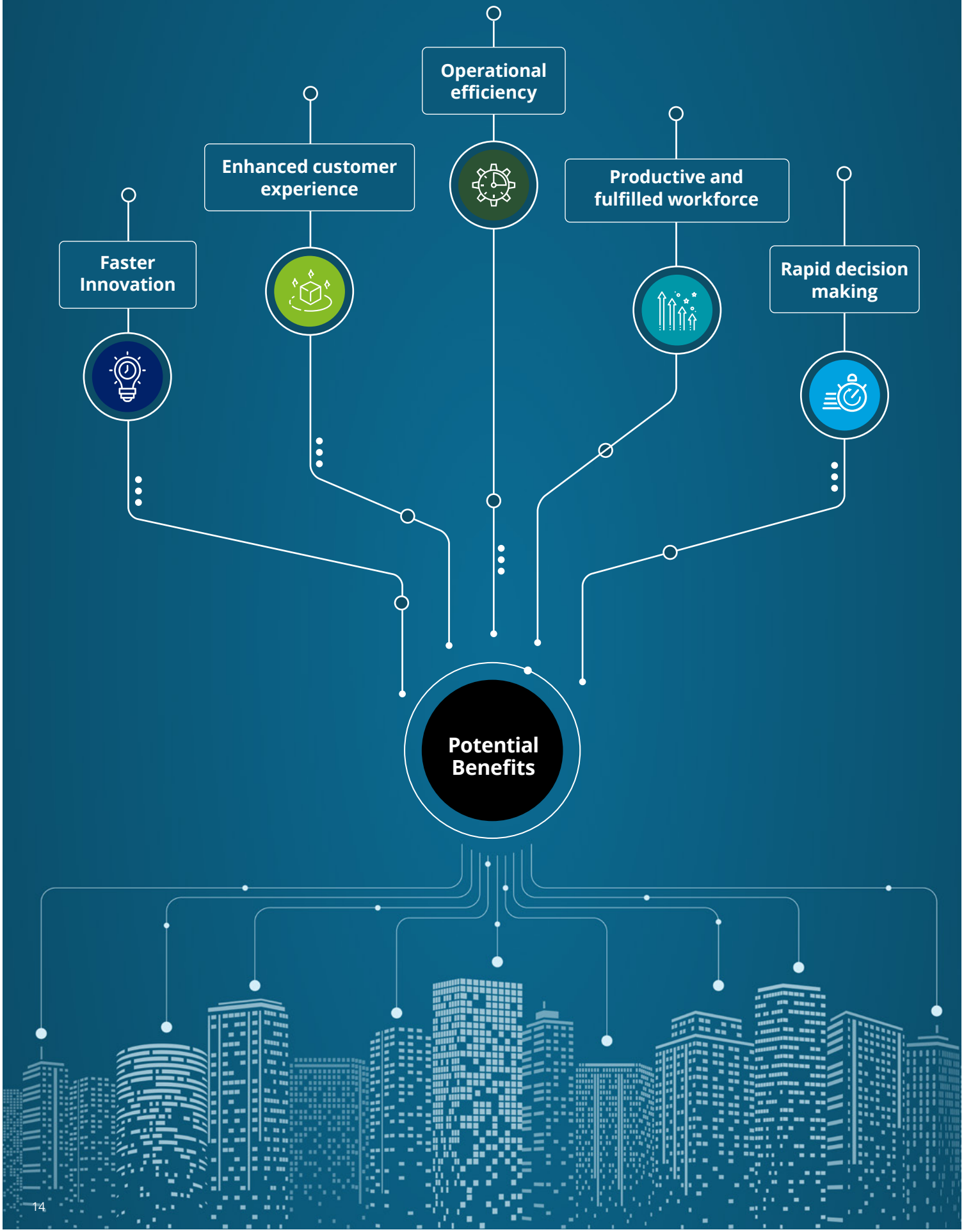
The hallmark of AI-fuelled organisations

An AI-fuelled organisation employs data as an asset to deploy AI across the enterprise in a human-centred and ethical way

AI-fuelled organisations utilise data as an asset for autonomous decision making through real-time processing, learning, and acting. They create human-centred digital experiences, enabling seamless human and machine interactions.

These organisations employ a diverse talent ecosystem, enabled by a culture of innovation that rewards ingenuity and risk-taking to utilise future of work insights and reimagine work. They have pioneered in utilising partnerships and ecosystems to drive innovation and growth within the organisation, directly impacting overall growth.

AI-fuelled organisations deploy AI across core business processes with a reimagined operating model to fully capture its potential. They also utilise a holistic ethical AI framework to generate trust across stakeholders.


Operational efficiency
Enhanced customer experience
Productive and fulfilled workforce
Faster Innovation
Rapid decision making
Potential Benefits

Transforming to an AI-fuelled organisation

A strategy- and AI insight-led approach can help organisations transition from an AI adopter to an AI fuelled organisation

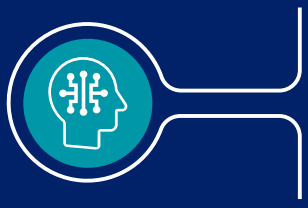
In this age, organisations need to design for agility with accountability, optimise for predictable performance, translate unknowns into knowns by scaling with speed, and reimagine existing processes with confidence. Organisations must understand costs, cascading impacts, and talent implications right from the beginning of adopting AI across functions and business units. Human-centred design is key to that understanding. It informs why multi-step approaches are needed and how they can serve larger purposes of the organisation.

"The synergy between human-centred design thinking and AI leads to swifter movement from empathising to prototyping and accelerates AI adoption."

- Prashanth Kaddi
Analytics and Cognitive Partner
Deloitte

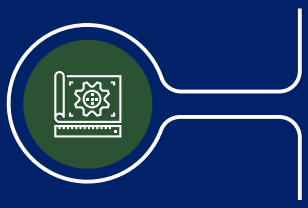
Develop an AI strategy

Establish an AI vision and roadmap to guide an organisation's AI journey towards value realisation and architecture, workforce, and governance capability building



Define a use-case -driven design process

Identify and prioritise AI use cases across businesses and functions, and develop AI business case and execution roadmap

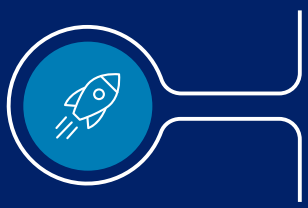


Experiment with prototypes

Validate use case viability and feasibility and experiment with prioritised use cases through prototype development

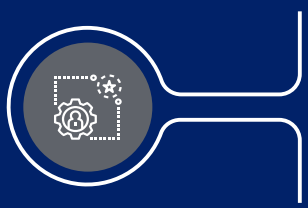
Build with confidence

Utilise an ethical AI framework to minimise bias, provide explain-ability, and facilitate the safe usage of AI solutions



Scale for enterprise deployment

Broadly deploy and scale AI solutions across the enterprise, utilising cloud infrastructure to achieve exponential returns



Drive sustainable outcomes

Transform business and operating models and organisational design to drive adoption for stronger and sustainable outcomes

Challenges and issues arising out of AI adoption

AI delivers exponential benefits to companies that can successfully harness its power; however, if improperly implemented, AI could negatively impact the company's stakeholders, reputation, and future performance.

Organisation

Inadequate governance over AI applications: Organisational silos can lead to disconnected groups creating and using algorithms in disparate ways, resulting in inconsistent policies and insufficient monitoring as new data flows in.

Insufficient data protection mechanisms: There may not be appropriate safeguards in place to make data tamper proof, exposing it to possibilities of fraud and cyber-attacks.

Improper secondary data usage: Data insights could be repackaged and inadvertently used in the secondary market in a way that violates customer's original consent.

Lack of experienced AI talent: Many organisations face a shortage of talent that has the technical capability and ability to understand the implications arising out of using AI at scale.

Lack of training for responsible parties: The parties responsible for curating data and building algorithms may not be trained on the organisation's ethical policies and guidelines.

Data

General bias in existing data: Using historical data to build an algorithm teaches it to make similar decisions in the future. If past decisions included bias, then the algorithm will reproduce it. Also, faulty/incomplete data collection could add an unintended input bias.

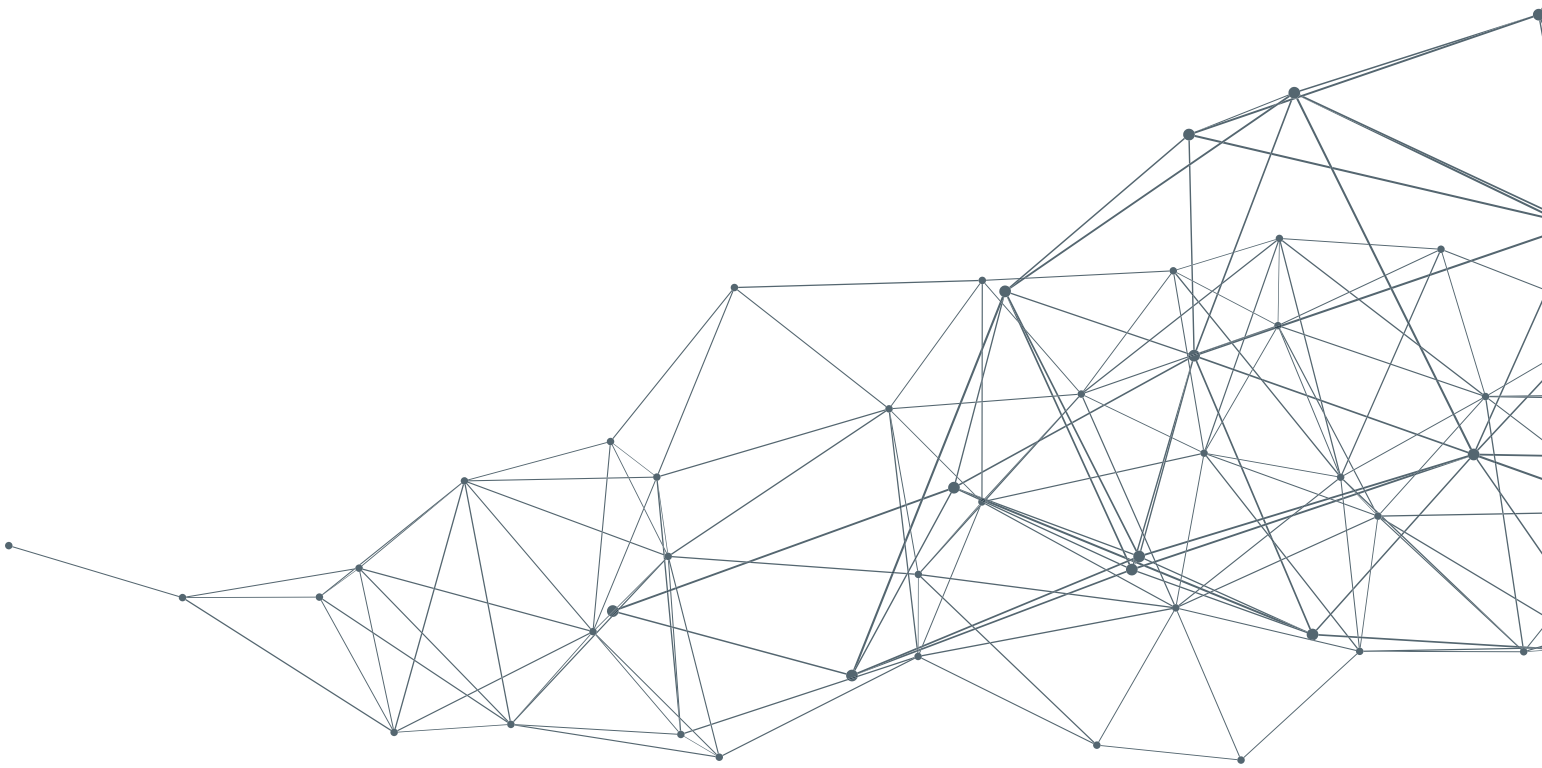
Underrepresentation of certain groups: If, for example, a protected class faced discrimination in the past (e.g., hiring, college admissions), there will be fewer instances of positive outcomes for that class in the data and the model will reproduce that bias.

Overrepresentation of certain groups: For instance, if a protected class has faced increased scrutiny due to discrimination (e.g., non-random checks for misbehaviour), there will be more instances of negative outcomes for that class present in the data and the model will reproduce that bias.

Algorithms

Functional form of an algorithm: The decisions produced by "black-box" algorithms are harder to explain, and therefore, harder to justify to stakeholders and during litigation. The "threshold" levels for decision-making algorithms can differentially impact protected classes.

Variation between training and the real world: Model performance in the real world may not be identical to performance on a training set. The environment changes constantly—from shifts in customer base and offerings to customers changing behaviours in response to algorithms. This results in AI algorithms producing unintended results at times.



Addressing ethical issues

Addressing ethics early safeguards against potentially disastrous consequences and can also lead to benefits above and beyond the immediate use case.

Despite widespread adoption of AI, organisations count ethical risks as a top challenge in implementing AI initiatives. Concerns include lack of explain-ability and transparency in AI-derived decisions and using AI to manipulate people's thinking and behaviour. A well-established governance and ethical model guides organisations to adopt AI more efficiently.

Deloitte's Trustworthy AI Framework™ is an effective tool for diagnosing the ethical health of AI, while maintaining customer privacy and abiding by relevant policies.

Fair/impartial
AI applications should include internal and external checks to ensure equitable application across participants. Organisations can minimise discriminatory bias in the data and algorithms through adjustments in the underlying data and the factors involved.

Transparent/explainable
All participants should be able to understand how their data is being used and how AI systems make decisions. All components, including algorithms,

attributes, and correlations, should be open to inspection by respective authorities to ensure compliance. End users can also have a channel to enquire and provide feedback.

Responsible/accountable

There should be organisational structures and policies in place to determine who is to be held accountable for the output of AI system decisions and that the systems being built are not harmful for humanity. Compliance with existing laws and regulations need to be ensured to showcase accountability to all the stakeholders.

Safe/secure

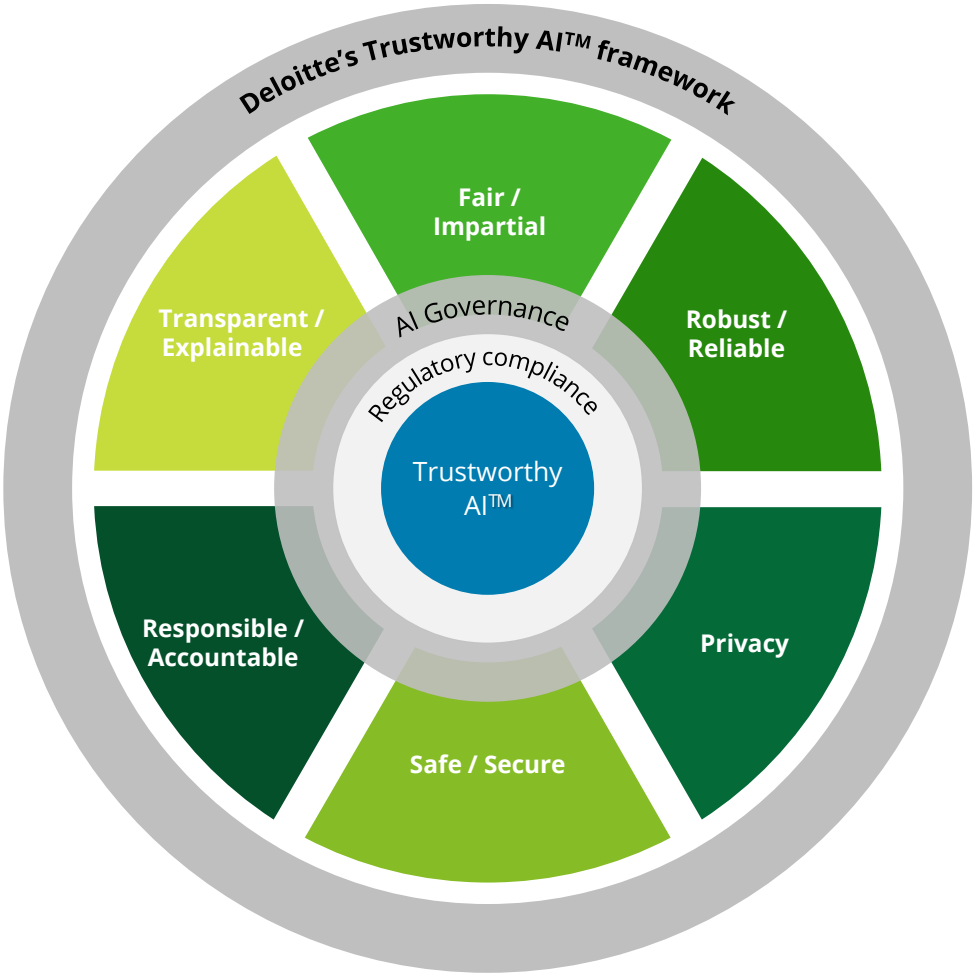
AI systems can be protected from risks including cyber risks that may cause physical and/or digital harm to organisations and their stakeholders. Organisations can safeguard themselves from the internal risks of fraud and abuse that may corrupt our data.

Privacy

Data privacy needs to be respected and customer data should be used beyond its intended and stated use by the organisation. Consumers should be able to opt in and out of sharing their data with the organisation and other third parties. End users should have access to resources to understand how AI is using their information.

Robust/reliable

AI systems have the ability to learn from humans and other systems and produce consistent and reliable output. Systems should be trained along the organisation's guidelines and policies to minimise any bias after the addition of the human input layer.



Source: Deloitte's Trustworthy AI Framework: https://www2.deloitte.com/us/en/pages/deloitte-analytics/solutions/ethics-of-ai-

The "Age of With™" across industries

Energy, Resources & Industrials
Organisations in ER&I are interested in applying AI to help optimise core processes. Some are investing in algorithms that automate the analysis of a range of data— including historical performance, machinery vitals, subsurface images, and technical documents—to more efficiently and accurately choose drilling locations and machinery investments.

Technology, Media & Telecommunications
AI & ML are being used to analyse video content to identify patterns in content and target specific customers for marketing based on historical user data. Network optimisation is also a prominent AI application in TMT that uses AI to predict and circumvent network bandwidth constraints based on real-time and historical data.

Life Sciences & Health Care
Life Sciences companies are applying AI to precision medicine and utilising Natural Language Processing and computer vision to make patient-level disease predictions and enable customised care based on gene variability, environment, and lifestyle. Using AI to help accelerate drug discovery has also emerged as a leading use case with such organisations and others in the industry. Drug discovery is a major focus area for AI amongst LS&HC organisations.

Government & Public Services

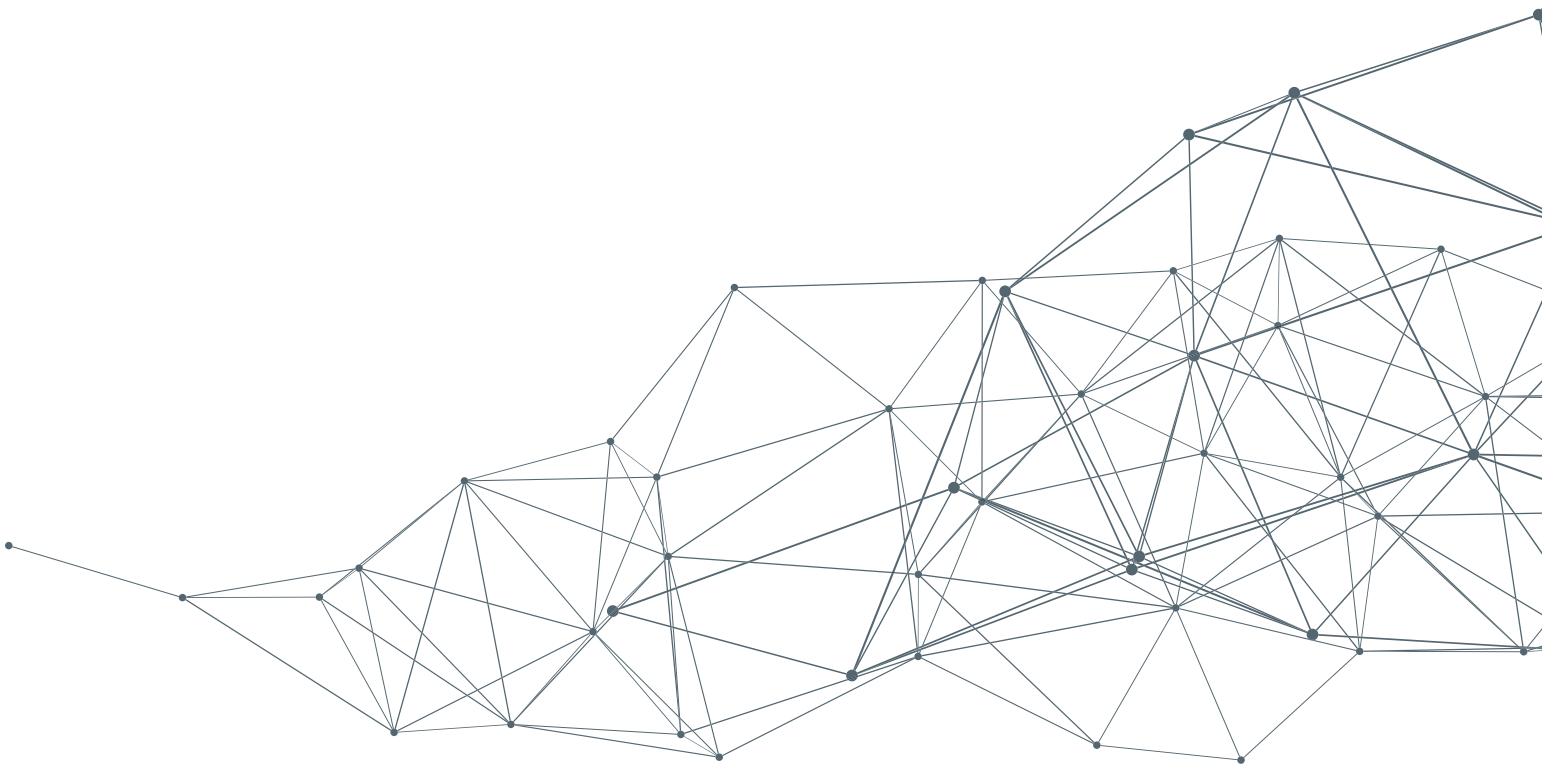
Governments around the world are investing in national AI strategies. Today, 80 percent of the early adopter public sector organisations surveyed by Deloitte are using or planning to use AI. Some examples include AI-enabled traffic lights, chatbots to help case-processing officers to answer questions, ML to detect fraud and waste in social benefit programmes, algorithmic crime prediction, and NLP to monitor the internet for radicalisation.

Financial Services

Financial services companies are using new digital assistants to handle millions of dollars by deploying Natural Language-(NL)-powered assistants that can answer customers' questions. Some financial firms are also using AI to enhance their customer reward programmes by analysing customers' seasonal spending tendencies and past behaviours and then directing them towards appropriate reward categories for redemption across portals.

Consumer Products & Retail

Organisations are providing personalised customer experiences and product recommendations by prioritising the development of automated, voice-activated personal-shopping services. Natural language-powered digital assistants and increased consumer personalisation are the focus areas for these organisations, in addition to cost-cutting business process automations.



Concluding remarks

In the “Age of With™”: Humans and machines, adopting AI organisation-wide is swiftly becoming an integral part of the corporate strategy across industries. Organisations are undertaking multiple initiatives, from setting up AI/ML COEs, training senior and mid-management on leveraging AI, and modernising data infrastructure, to effecting company-wide adoption and gaining a competitive advantage.

AI offers tremendous growth opportunities for current and future adopters, who can take a centralised-federated approach and focus on integrating and scaling across functional units. Emerging risks and regulations may slow down overall adoption and innovation efforts but addressing the risks in a comprehensive manner can make the transition smoother. Designing principles and processes to actively manage AI risks can help the organisations build trust with its stakeholders.

The “Age of With™” is going to disrupt businesses over the next 18–24 months and AI adoption strategies and implementation practices will define the competitive advantage organisations gain as a result.

CII Profile

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government and civil society, through advisory and consultative processes.

For 125 years, CII has been working on shaping India's development journey and, this year, more than ever before, it will continue to proactively transform Indian industry's engagement in national development.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with about 9100 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 288 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

With the Theme for 2020-21 as Building India for a New World: Lives, Livelihood, Growth, CII will work with Government and industry to bring back growth to the economy and mitigate the enormous human cost of the pandemic by protecting jobs and livelihoods.

With 68 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

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