Applying AI to the real world

A guide to unlocking AI's potential

CGI

Introduction

This guide will help you understand the potential of Artificial Intelligence (AI), and the questions you need to ask to make informed and confident decisions to realise an impactful AI implementation. We will explore the three tiers of AI design and their transformational impact on businesses, and how best to ensure your organisation remains competitive, innovative and successful in this rapidly evolving digital age.

About the author

Chris Annone is CGI UK's AI & automation practice lead in London, managing a team of consultants delivering AI and automation solutions across the UK for organisations in both the public and private sectors.

With over 17 years' technology experience from enterprise solution design to commercial modelling, Chris is a promotor of impactful change. He ensures that there is a clear purpose to projects, ensuring that they not only deliver improvement but that they are also aligned to the organisation's strategy and vision.

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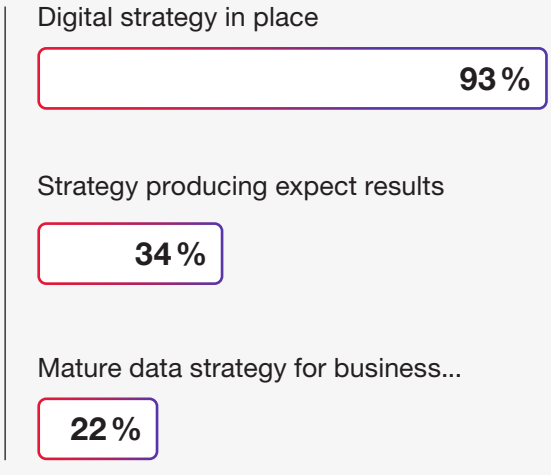
The reality of building an AI strategy

The potential of AI to revolutionise all industries is immense, promising increased efficiency, enhanced customer experiences, and innovative solutions to complex problems. According to our annual CGI Voice of Our Clients survey[1] the digital transformation of all industries is accelerating, with 72% of our clients saying it is highly impacting their business model. Most of them (93%) have defined digital strategies, but only 34% (up from 30% in 2023) are achieving the expected results. To boost their business model agility, which only 21% claim to have, they need to leverage the immense potential of AI.

AI is the top innovation investment priority for the next three years, as it was in 2023. However, only 26% have implemented or are implementing traditional AI, although 79% are exploring generative AI. To succeed with AI, they also need to deepen their focus on data, which is still a challenge for many. Only 53% have a holistic data strategy for the enterprise and ecosystem, and only 22% (up from 18% in 2023) have a highly mature organisation to use data and digitisation. Data management, governance, and quality are the main areas for improvement, especially for AI use cases.

Is the digital strategy working?



The journey to implementing AI is fraught with complications and digital leaders face a maze of challenges and considerations when deciding on an AI strategy. Every decision they make carries real weight, and a wrong turn can waste resources, lead to unmet expectations, and put them at a competitive disadvantage. Understanding the specific needs of all their internal stakeholders and customers is crucial.

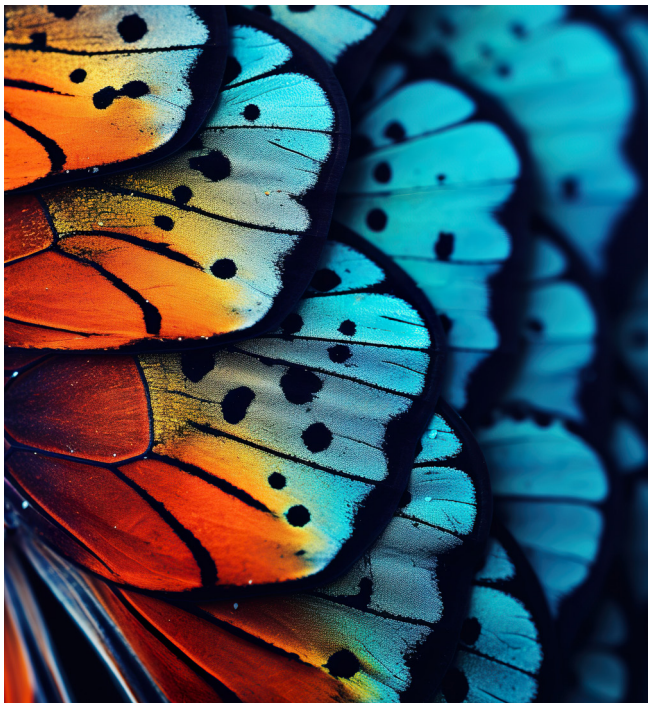
Leaders must evaluate a plethora of AI technologies, each with its own unique benefits and challenges when mapped to their existing landscape and employee skills. In a world where 4 in 5 businesses have IT recruitment challenges and around half report legacy systems as a high barrier to implementing their digital strategy, the key is to prioritise projects that align with strategic goals while offering the best return on investment.

1 - Statistics are from **The CGI Voice of Our Clients 2024** research, based on responses from one-on-one interviews with 1,829 executives across the industries and geographies we serve. These strategic conversations provide unique insights into how organisations view the impact of macro trends, industry trends and priorities, innovation investments and more.

By following these steps and asking the right questions (see below), businesses are approaching AI strategically and will maximise its potential for positive transformation.

To cut through the hype, this guide will consider these key questions about the AI categories and tools, and their real-world impact:

1. What are the main AI technology categories?
2. What problems do they each solve?
3. How are they applied?
4. How easy are they to implement?
5. What are the complications?
6. Is it a point solution or does it have a broad application?
7. What is the enterprise-wide transformation potential of implementing this technology?



Top tips

- **Start small but think big:** Implement rapid point solutions to prove value and compatibility, whilst planning for the ultimate vision of a transformed business.
- **Build your AI roadmap:** Short-term goals (6-12 months), medium-term goals (1-3 years), long-term vision (3-5 years).
- **Knowledge is power:** The scale of benefits achieved will depend on which technologies are implemented and the techniques used. An enterprise-wide transformation will require an intelligent systems approach.
- **Seek expert advice:** Consult with AI specialists who can help assess your needs and recommend suitable solutions to meet the desired business outcomes.

AI implementation levels and business impact

We'll explore how AI implementation progresses from solving specific problems to revolutionising entire systems, and how each level of integration can benefit your organisation. By understanding these tiers, you'll be better equipped to make informed decisions about AI adoption and integration within your company. Let's look at each tier to understand its potential impact and how it can reshape your business operations.

Tier 1. Component level

At this foundational level, we focus on individual AI technologies such as Machine Learning (ML), Deep Learning (DL), Robotic Process Automation (RPA), Large Language Models (LLMs), Computer Vision, and various forms of automation.

These technologies, when implemented individually, can solve specific problems within your organisation. For example, you might use RPA to automate repetitive data entry tasks, or machine vision to improve quality control in manufacturing. While these implementations can create noticeable benefits, they typically don't lead to system-wide transformation.

The advantage of this level is that it's often easier to implement and can show quick wins. However, the impact is usually limited to solving point problems rather than transforming entire processes or departments.

Component level		
Implementation considerations	**Challenges**	**Strategic value**
Easier to start with and often requires less investment	May create data silos if not planned properly	Helps familiarise your team with AI technologies
Can be implemented in phases, allowing for gradual adoption	Limited scalability across the organisation	Can address specific pain points quickly
Useful for proof-of-concept projects to demonstrate AI's potential	Potential for redundant solutions in different departments	Provides tangible results to build confidence in AI initiatives

Tier 2. Combined level - Intelligent Automation (IA)

This tier represents a step up from individual components. Here, we combine AI technologies with automation to create IA solutions. IA often has a more significant impact, typically at the departmental level.

For instance, you might use machine learning algorithms in conjunction with RPA to create a system that not only automates data entry but also learns to identify and flag unusual patterns in the data. This combination can greatly enhance efficiency and accuracy in areas like finance or customer service.

However, IA can be limited when dealing with legacy applications and processes, as it often relies on RPA to interact with these older systems. Additionally, IA solutions are typically designed to solve process tasks and may not inherently surface real-time data for decision-making.

Combined level - Intelligent Automation (IA)		
Implementation considerations	**Challenges**	**Strategic value**
Requires more coordination between departments	Integration with legacy systems can be complex	Can significantly improve operational efficiency
Often involves process re-engineering	May require significant change management efforts	Enables more sophisticated data analysis and insights
May need specialised skills or partnerships with AI/automation vendors	ROI can take longer to realise compared to component-level implementations	Potential for substantial cost savings in process-heavy departments

Tier 3. Intelligent systems level

This is the most advanced and transformative tier. Intelligent Systems (IS) take IA to the next stage and represent a wider architectural and functional approach to AI integration.

At this level, businesses can achieve truly transformational impact through enhanced automation and real-time decision-making. It requires full integration of Commercial Off-The-Shelf (COTS) backend business systems (like ServiceNow, Dynamics 365, Salesforce) with customer, business, and tech interfaces. This is combined with a robust data analysis platform to produce automated predictions and actions.

Key aspects of here include:

- Integration of multiple technology pillars
- Redevelopment of legacy processes and applications
- Implementation of a system control and improvement layer for governance
- AI tools and techniques form components of the solution, rather than being the entire solution.

The intelligent systems approach can lead to organisation-wide transformation, enabling real-time data-driven decision-making, predictive analytics, and highly efficient automated processes across all areas of the business.

Intelligent systems level		
Implementation considerations	**Challenges**	**Strategic value**
Requires a comprehensive, organisation-wide strategy	Complex implementation that may take years to fully realise	Enables true digital transformation of the entire business
Significant investment in technology infrastructure and talent	Requires buy-in and coordination across all levels of the organisation	Provides a competitive edge through data-driven decision making
Often involves cultural and structural changes in the organisation	May face resistance due to fears of job displacement	Creates opportunities for new business models and revenue streams

Organisations can progress through these levels over time, starting with component-level implementations and gradually moving towards Intelligent Systems as they build capabilities and realise benefits. However, if enterprise transformation is the target, it is also vital to plan for an intelligent systems target operating model to avoid technology dead ends and wasted effort.

Comparing the AI transformation benefit

As businesses evaluate the transformative potential of AI, it is crucial to consider the scale, impact, and ease of implementation of various AI technologies. Figure 1 provides a comparison of all these factors to help you identify the most strategic AI investments for your organisation.

- **Scale:** How widely does a technology influence an organisation?
- **Business impact:** How significant is the effect on a company's operations, efficiency, and strategy?
- **Ease of implementation:** How complex or expensive is it to implement?

Note that the analysis is not exclusive to application. For example, Intelligent Systems and Intelligent Automation are impactful strategic solutions at the enterprise level but can present challenges for implementation into legacy environments, which need careful assessment and expert support. Likewise, targeted solutions such as Machine Learning and Computer Vision can have a transformational impact if the use case is aligned.

The next section provides more detail about each AI category, explaining the technology, exploring the use cases, potential impact, and challenges.

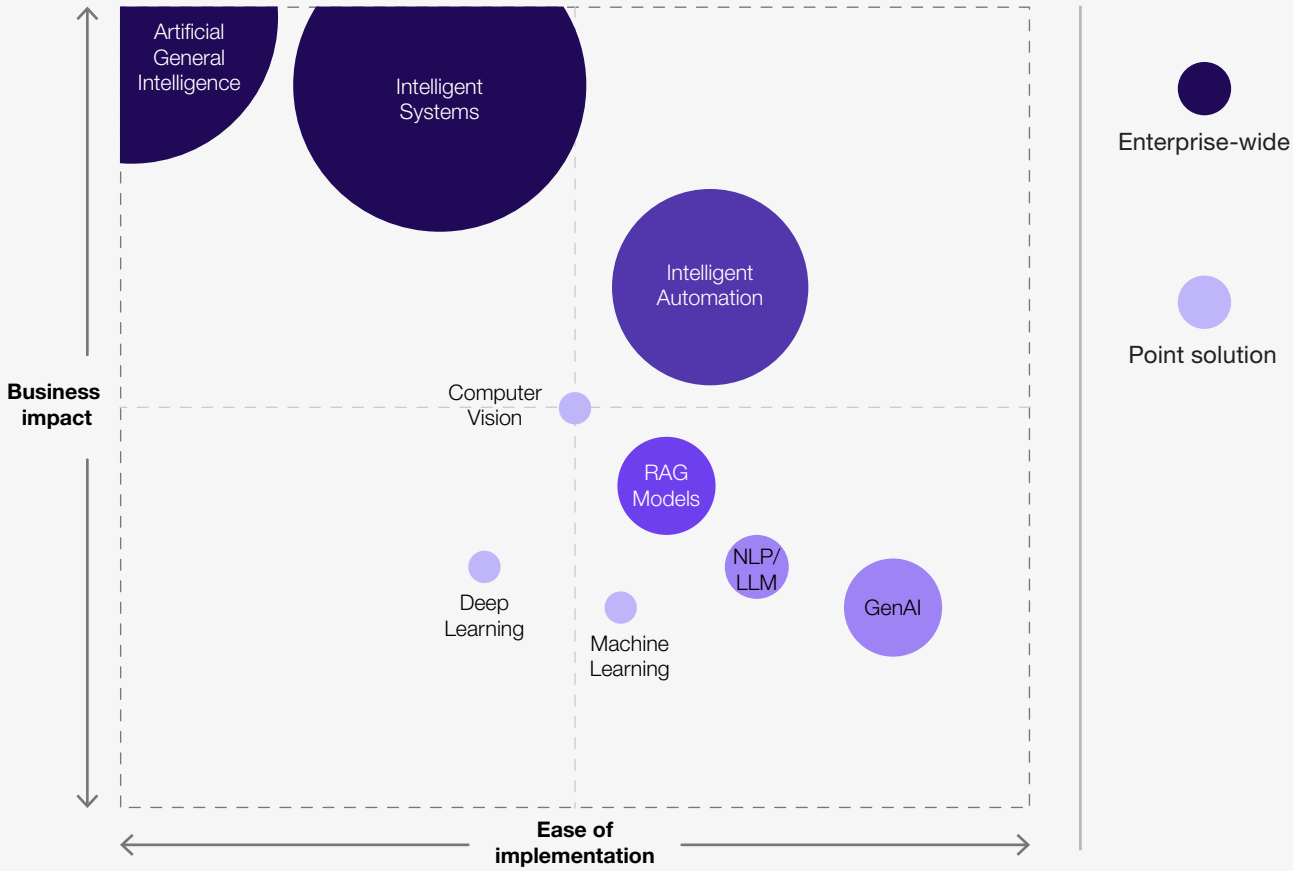


Figure 1 – Mapping of the scale of influence vs impact of a technology and complexity of implementation

Transformation power of AI solutions

AI technologies offer varying degrees of transformative power. This section quantifies the enterprise transformation potential of the various AI categories.

AI categories and applications - The combined solutions					
Category	Implementation	Impact	Scale	Enterprise transformation potential	Summary and real-world examples
Intelligent Automation (IA)	65%	65%	60%	39%	Intelligent automation (IA) combines AI with automation to enhance complex workflows in areas such as back-office operations and customer service by streamlining processes. For instance, banks use IA to accelerate loan application processing, reducing approval times from days to minutes. This automation increases operational efficiency, though issues include integration and managing workforce impact. Key technologies include MS Power Automate, UiPath, and Blue Prism.
Intelligent Systems (IS)	35%	90%	100%	90%	Intelligent systems (IS) integrate off-the-shelf business products with IA and AI techniques, enabling oversight and decision support. Self-driving cars, which capture, process, model, and action real-time data, exemplify the intelligent systems approach. For all businesses this approach can interconnect back-office and front-office operations, improving efficiency, real-time decision-making, and enabling new business offerings. Legacy systems can complicate the implementation, but the impact can be substantial.
Artificial General Intelligence (AGI)	0%	100%	100%	N/A	Artificial general intelligence is a theoretical solution that aims to match or surpass human intellectual capabilities and flexibility, profoundly impacting society and business. However, AGI is currently a distant goal, fraught with ethical dilemmas, potential unintended consequences, and significant technical hurdles. Currently, AGI remains non-existent outside of science fiction.

AI categories and applications - The building blocks					
Category	Implementation	Impact	Scale	Enterprise transformation potential	Summary and real-world examples
Machine Learning (ML)	55%	25%	10%	3%	Machine learning (ML) includes supervised, unsupervised, and reinforcement learning, significantly shaping decision-making across sectors. Retailers use ML for personalised product recommendations, which significantly boost sales. ML relies on high-quality labelled data, uncovers hidden patterns, and is suitable for dynamic environments like automated trading. Key technologies include Python libraries, Apache Spark, and Google DeepMind.
Deep Learning (DL)	40%	30%	10%	3%	Deep learning (DL) technologies include convolutional neural networks (CNNs) for image recognition, recurrent neural networks (RNNs) for NLP, and transformers for advanced NLP tasks like translation. Healthcare providers use DL, especially CNNs, to analyse medical images, enabling earlier and more accurate diagnoses. These tools enhance automation and efficiency across sectors. Key technologies include TensorFlow, PyTorch, GPT and Hugging Face.
Natural Language Processing (NLP) and Large Language Models (LLMs)	70%	30%	20%	6%	NLP and LLMs improve customer service with chatbots and streamline processes. For example, insurance companies utilise NLP to enhance claims processing workflows and customer engagement. Text summarisation and translation are also significant, aiding global content management. Key technologies include Azure AI Bot Service, Google Translate, and Amazon Translate.

AI categories and applications - The building blocks					
Category	Implementation	Impact	Scale	Enterprise transformation potential	Summary and real-world examples
Generative AI (GenAI)	85%	25%	30%	8%	GenAI, particularly through text-to-image and text-to-video models, is revolutionising creative processes across industries. Pharmaceutical companies, for instance, are using GenAI to speed up drug discovery and improve clinical trials. For enterprises, specialised versions of GenAI offering enhanced security, scalability, and customisation features are available. The potential of GenAI to support new levels of creativity and efficiency for coding and content creation is immense, making it a powerful tool for organisations looking to grow and differentiate themselves. Key technologies in this field include GPT, Gemini, Claude and DALL-E.
Retrieval Augmented Generation (RAG)	60%	40%	30%	12%	RAG models solve siloed knowledge problems, boosting information accuracy and user satisfaction. Law firms, for instance, employ RAG to enhance legal research efficiency by quickly finding relevant case law. These models moderately impact productivity but require integration into existing systems for operational efficiency. Examples include Microsoft Copilot, OpenAI Assistants API, and Elastic.

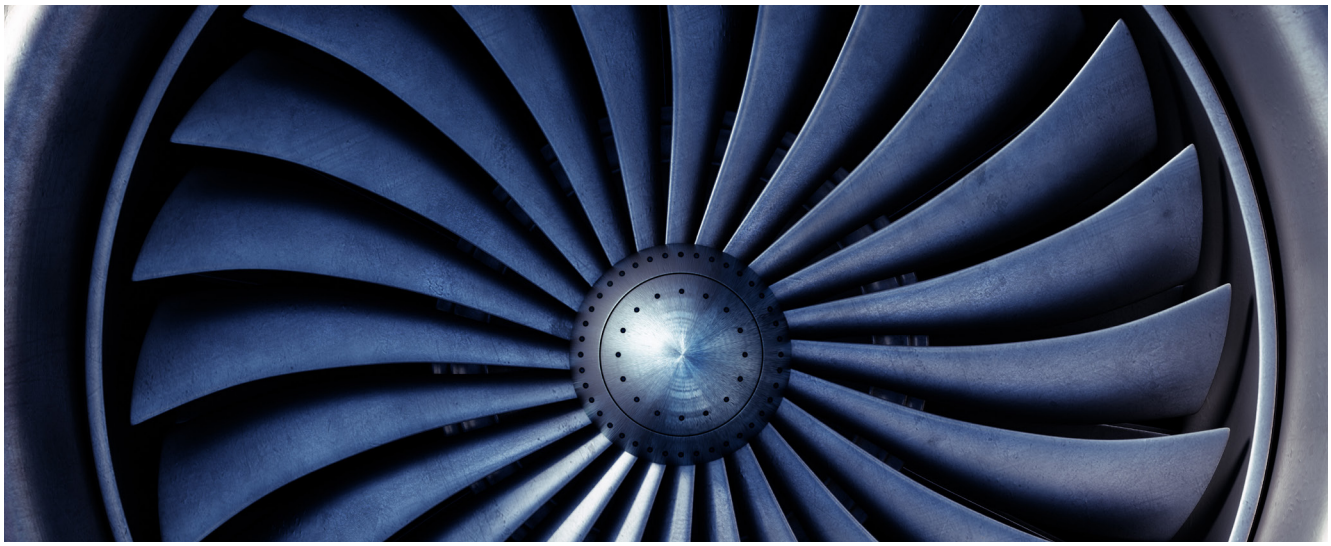
Prioritising AI solutions by transformation potential

Whilst each AI category has unique benefits and complications there are some that have a greater scale of transformational impact on the business.

Increasing transformational impact

- With the tools we have now and on the horizon, implementing **intelligent systems** is the key to unlocking transformational business change. However, it is critical that they are designed and built from the ground up, incorporating specialist AI knowledge with collaboration from business leaders to successfully embed them into complex environments.
- Retrofitting **intelligent automation** solves many problems caused by an ageing landscape by combining AI technology with automation. Whilst it gains in part from a mature technology set, it is better at solving individual business problems rather than enterprise-wide transformation.
- **RAG** models are now at a maturity level to solve the siloed knowledge problem efficiently, but they are not a utopian solution; they give knowledge, but don't implement action.
- Similarly **NLP, LLMs** and **GenAI** also bring their own strengths either in the conversation or content generation space, but practical and technical limitations are reached quickly. These limitations must be understood prior to implementation, and they should not be expected to solve problems on their own.
- **Machine learning** and **deep learning** are building blocks to solve tactical problems. This can be transformative to a specific business operation or enable new lines of business and insight into untapped data. However, it's not a one-size-fits-all approach to enterprise transformation.

Where to start

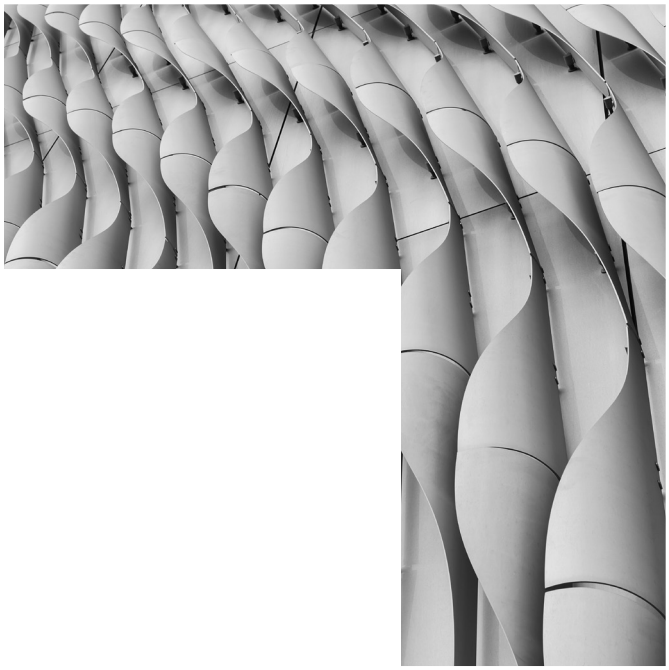


An assessment of the digital maturity and AI readiness of the organisation is essential, covering data, the current IT infrastructure, and employee skills and knowledge.

- **Identify needs and challenges:** Begin by understanding where your business struggles or could be optimised. Can AI automate tasks, improve forecasting, personalise customer experiences, or streamline processes?
- **Evaluate current data:** AI thrives on data and requires access to lots of it. Assess the quality, quantity, structure and accessibility of your data to determine if it's sufficient for AI implementation.
- **Explore potential applications:** Research how similar businesses leverage AI. Consider areas like marketing, finance, supply chain, and customer service.

Ready to find out more?

Feel free to get in touch with our experienced AI consultants if you want to hear more about how we are ensuring technology makes a transformational business impact for our clients. We understand the business strategy challenges, and the wide technical landscape that is key to achieving the transformational change required to remain competitive. Let's explore how we could work together to unlock the full potential of AI for your organisation.



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We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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