Business applications of Artificial Intelligence:

A framework to categorise AI use cases

UKRI Innovate UK

BridgeAI

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About the briefing paper series

A significant barrier to AI adoption in the business world is the scarcity of clear, accessible information on how to leverage AI to enhance organisational productivity. Understanding the practical applications of AI is a prerequisite for companies to identify relevant opportunities and develop a strategy to operationalise them. To address this need, the AI Governance and Regulatory Innovation team at The Alan Turing Institute is pursuing a research project to illuminate how businesses in the four BridgeAI priority sectors of agriculture, forestry and fishing, construction, creative industries, and transportation and storage can leverage AI to be more productive.

The first milestone of this project is the publication of a framework for categorising and analysing business applications of AI and a brief analysis of sector-specific AI use cases. Our findings are published as a **series of five documents**: four sector-specific briefings complemented by a paper presenting a framework to categorise and analyse AI use cases. The sector briefings offer a short analysis of the high-level economic features of each sector in the UK, the specific challenges to AI adoption faced by businesses in that sector, and five business applications of AI per sector. Each sector brief can be read as a standalone document. The paper on the framework presents the tool that we developed to categorise and analyse AI use cases in a business context. In addition to providing the hermeneutical structure underpinning our research, this tool provides a valuable resource for businesses trying to identify relevant AI opportunities. Companies can use this framework as a starting point to build on and develop their bespoke methodology to identify, select, and implement the right AI solutions.

The second milestone of this project will be to refine the framework based on feedback collected after the publication of this first exploratory version and expand its scope to include information about the risks connected to each AI use case and the mitigation strategies that can be adopted to address those risks in that specific context.

Desired impact

Our research aims to support businesses at the early stages of their AI adoption cycle. By providing a conceptual framework to systematically categorise business applications of AI and offering concrete examples of sector-specific AI applications, we hope to help businesses identify possible uses of AI in their area, understand the nature of relevant technological solutions, and develop a sound strategy to operationalise those solutions responsibly.

Intended audience

The audience for this briefing series is primarily businesses within the BridgeAI priority sectors looking to adopt AI to support their operations. It is worth noting that the accompanying framework was developed based on generalised principles which are applicable to any sector and should, therefore, provide value to a wider audience, including non-commercial organisations. In addition to benefiting companies, this briefing series provides valuable resources for government officials and regulators aiming to understand how businesses use AI, as well as for training officers and advisors seeking a systematic approach to developing AI strategies for business.

AI Governance and Regulatory Innovation team

This work has been completed by researchers from The Alan Turing Institute who are part of the AI Governance and Regulatory Innovation team based within the Public Policy programme. As part of our offering for the BridgeAI programme, we support UK businesses navigate the increasingly complex AI governance landscape. This is delivered through training and sector-specific research on some of the most pressing AI governance issues, as well as by engaging with regional AI policy stakeholders to help consolidate a nationwide community of actors invested in responsible AI governance.

Introduction

Artificial intelligence (AI) is rapidly transforming the global economy, yet many sectors of the business world are only beginning to explore the opportunities AI technologies offer. Despite AI adoption being on the rise globally, the technology's potential to support organisations by improving their productivity and competitiveness remains partially unexplored in many economic areas. For instance, only 20% of small companies in the UK say they use at least one AI tool as part of their operations, despite 55% stating that AI could provide benefits to their business.[1] To ensure AI will benefit a wide range of sectors and regions and support businesses in their AI adoption journey, the UK government launched several high-impact initiatives to "invest and plan for the long-term needs of the [country's] AI ecosystem".[2] These include, among others, the BridgeAI programme, which aims to foster the development and adoption of AI technologies in sectors with high potential for AI-driven economic transformation.[3]

Despite important steps forward, several barriers to widespread AI adoption still exist. These include the high cost of AI solutions, the uncertainty of their return on investment,[4] the scarcity of relevant technical and business skills in the labour market,[5] regulatory uncertainty related to the development and use of AI,[6] low rates of senior management buy-in, the difficulty of collecting or accessing high-quality data,[7] and scepticism for some AI applications caused by ethical concerns around issues such as bias and privacy. At a more fundamental level, many companies struggle to identify the right AI opportunities due to a general lack of awareness about the full range of practical business applications of these technologies. In other words, many companies are unsure about how exactly to leverage the potential of AI to support their business goals. For instance, a recent survey of 100 business leaders from different countries and sectors found that while "leaders are overwhelmingly looking at AI as an opportunity, the picture is not yet clear on how to harness this opportunity practically."[8]

One way to address this uncertainty is disseminating knowledge about existing AI use cases and best practices in the industry. Understanding how other companies use AI technologies, be it to support internal functions or to build better products and services, enables businesses that are considering embarking on the journey of AI adoption to think creatively about how AI can add value to their organisation.

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1 Russell, C. & E. Quist (2024). *Redefining intelligence: The growth of AI among small businesses.* Federation of Small Businesses. https://www.fsb.org.uk/resource-report/redefining-intelligence.html.

2 UK Government (2021). *National AI Strategy.* https://www.gov.uk/government/publications/national-ai-strategy/national-ai-strategy-html-version.

3 Innovate UK (2023). *BridgeAI.* https://iuk.ktn-uk.org/programme/bridgeai/.

4 CDEI (2021). *UK Business Innovation Survey*. https://assets.publishing.service.gov.uk/media/61bb2e77e90e07044462d8b7/Business_Innovation_Survey_2021.pdf.

5 *AI ecosystem survey informing the National AI Strategy.* The Alan Turing Institute, https://www.turing.ac.uk/sites/default/files/2021-09/ai-strategy-survey_results_020921.pdf.

6 Gillespie, N., S. Lockey, C. Curtis, et al. (2023). *Trust in Artificial Intelligence: A global study.* The University of Queensland and KPMG Australia. https://policy-futures.centre.uq.edu.au/files/16650/Trust%20in%20AI%20Global%20Report_2023_UQ.pdf.

7 Mittal, N., Saif, I. & Ammanath, B. (2022). *Fueling the AI transformation: Four key actions powering widespread value from AI, right now.* Deloitte, https://www2.deloitte.com/content/dam/Deloitte/us/Documents/deloitte-analytics/us-ai-institute-state-of-ai-fifth-edition.pdf.

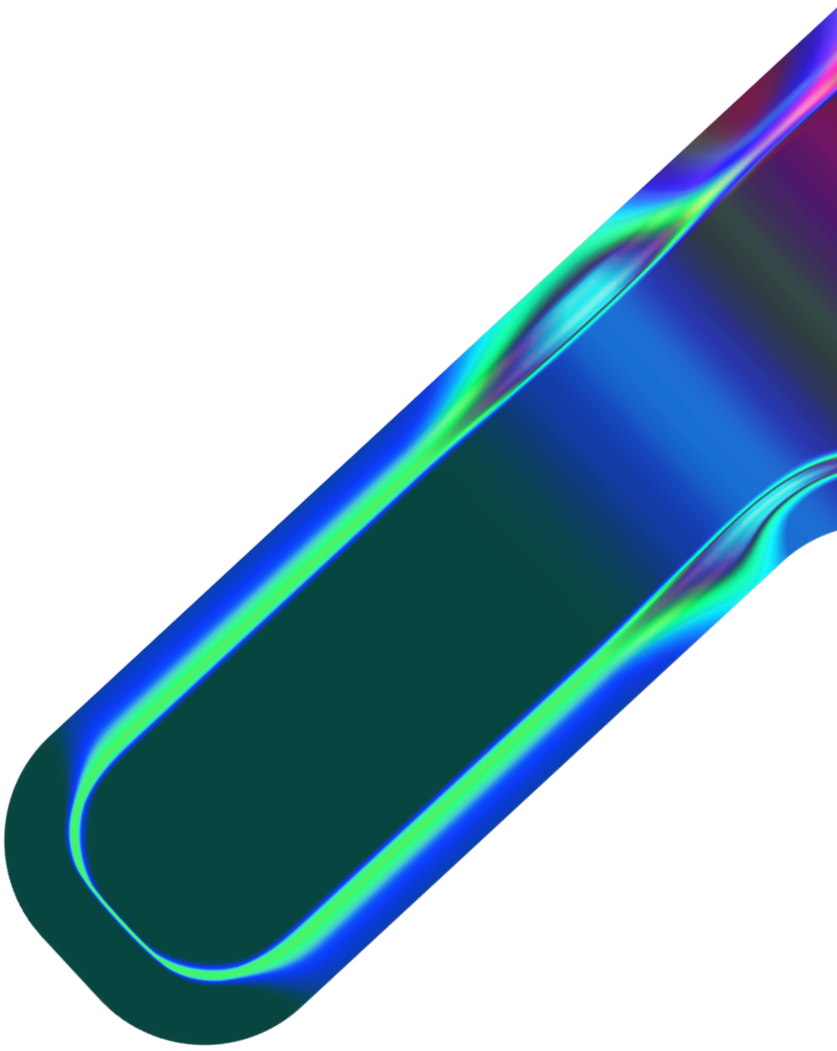
8 Bicakci, B. et al. (2024). *Leadership in the Age of AI.* EgonZehnder and Kearney. https://www.egonzehnder.com/leadership-in-the-age-of-ai.

Based on this premise, this briefing proposes a framework for categorising and analysing business applications of AI technologies. The framework builds on existing templates for collecting and categorising AI use cases[9] to offer a conceptual structure to help businesses prioritise efforts in exploring the potential of AI to drive growth and innovation. Specifically, it can support them in:

a. identifying available AI solutions;

b. selecting the right solutions to advance specific business goals;

c. developing an effective strategy to implement those solutions.



9 Other existing frameworks relevant to the one presented here include the *OECD Framework for the Classification of AI Systems; the EIT Taxonomy for the European AI Ecosystem; and ISO/IEC TR 24030:2024 – AI use cases.* We used these resources to ground and inform our research, and ensure we avoided any unnecessary duplication. At the same time, none of these frameworks covers the full scope of our research, which required the development of the framework we are presenting here. For instance, the OECD Framework focuses on a generic classification of AI systems rather than on specific use cases for business. The taxonomy developed by the EIT aims to map the landscape of AI use cases in the EU but does not provide sufficient detail on some foundational components of AI systems such as the input data, the operational environment of the system, or the readiness level of the technology. ISO/IEC TR 24030:2024 offers a comprehensive template to collect AI use cases but it assumes the availability of information that is usually only available to organisations that already adopted AI and possess detailed insights into the context and the characteristics of the use case. Our framework, while consistent and interoperable with existing taxonomies, is specifically designed to support businesses at the early stage of the AI adoption cycle in identifying and selecting AI opportunities strategically.

Research design and methodology

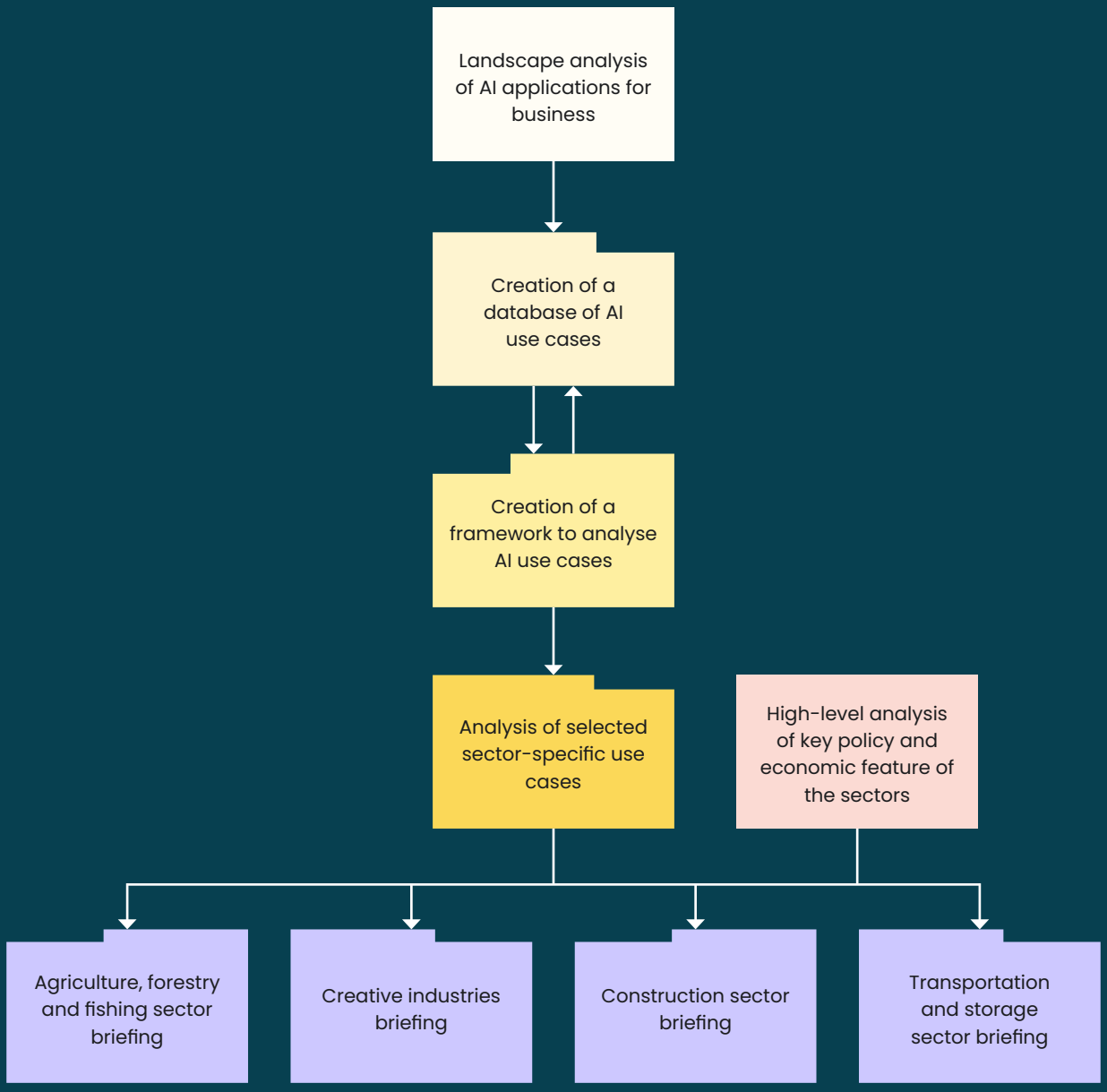
This briefing paper is part of a larger research project aimed at investigating how AI is applied by businesses in the four priority sectors falling within the scope of the BridgeAI programme, what risks are connected with those use cases, and what best practices and mitigation strategies can be adopted to mitigate those risks.

In this first round of publications, we present the results of Phase 1 of this project. Our objectives in this phase were to identify strategically important information that businesses should prioritise when considering an AI use case, develop a framework to categorise and analyse AI use cases based on such information, and use the framework to discuss real-world, sector-specific AI use cases.

A good classification framework is descriptive, explanatory, robust, and succinct.[10] With these considerations in mind, we developed this framework following an iterative prototyping and refinement methodology. We started by developing a draft classification structure based on existing knowledge of the field supported by a literature review, then refined and validated it through multiple cycles of prototyping, testing on real-life use cases, and feedback from both internal working groups and external stakeholders. For the purposes of trialling and refining the framework, we used 40 real-world AI use cases collected from both primary and secondary sources. These include case study documentation provided by companies, academic papers, and, where adequate, grey literature. We then used the framework to analyse 20 industry-specific use cases – five per sector – in the transport and storage; agriculture, forestry and fishing; construction; and creative industries sectors. We expand on the results of this analysis in a set of four sector briefings.

10 Kwasnik, B.H. (1999). *The Role of Classification in Knowledge Representation and Discovery.* Library Trends, vol. 48(1), p. 24.

Phase 1



Research design: Phase 1

AI use case framework

Our proposed framework relies on nine categories of information in relation to a given AI use case, with each category of information comprising a set of possible values. These nine categories of information can be subsumed under four higher-level 'dimensions', depending on whether they capture information about the (1) organisation, (2) AI system, (3) input data processed by the system, or (4) the economic sector in which the use case is deployed.

The table below summarises the framework. In the following subsections, we elaborate on each category of information and its importance in developing a comprehensive business strategy for AI.

Organisation

Area of application

- Product-centric / Service-centric
- Process-centric

Business function

HR management	Accounting	Logistics	Research and development
Planning and budgeting	Compliance and justice	Management of organisational assets	Sales
ICT management	Customer service	Marketing and advertisement	Service provision
Quality control	Production		

AI system

AI system capabilities

Goal-directed action	Prediction and forecasting
Recognition and detection	Recommendation
Generation	Simulation
Optimisation	

Environment

- Physical
- Virtual

Readiness level

- Hypothetical
- Early development
- Proof of concept
- Operational

Data

Types of input data

Audio	Signal	Categorical	Geospatial
Visual	Numerical	Textual	

Processing of personal data

Yes	No

Economic sector

Sector	Subsector		
Agriculture, forestry and fishing	Crop	Animal production and hunting	Forestry and logging	Fishing and aquaculture
Construction	Buildings	Civil engineering	Specialised construction works
Creative industries	Advertising and marketing	Architecture	Crafts
	Design	Film, TV, radio and photography	IT, software and computer services
	Museums, galleries and libraries	Music, performing and visual arts	Publishing
Transportation and storage	Air	Rail	Road
	Space	Water	Warehousing and support activities

Dimension 1: Organisation

One of the first steps in developing a targeted strategy for AI adoption is understanding which areas and processes of an organisation's structure can benefit from AI. The first dimension of our framework includes two categories of information that capture aspects of the role that AI can play within an organisation:

- Area of application of AI;
- Business function to which AI is applied.

Area of application

The first category under the 'Organisation' dimension provides a high-level perspective of whether a company leverages AI in the form of AI-enabled products and services offered to customers or if it uses AI internally to support its business functions. More specifically, we distinguish between:

- Product-centric/service-centric AI applications for cases where AI is integrated into products or services offered to customers.
- Process-centric AI applications for cases where AI is used to support the organisation's business functions. Business functions can be fully internal or take place at the interface with partners, clients, or suppliers.

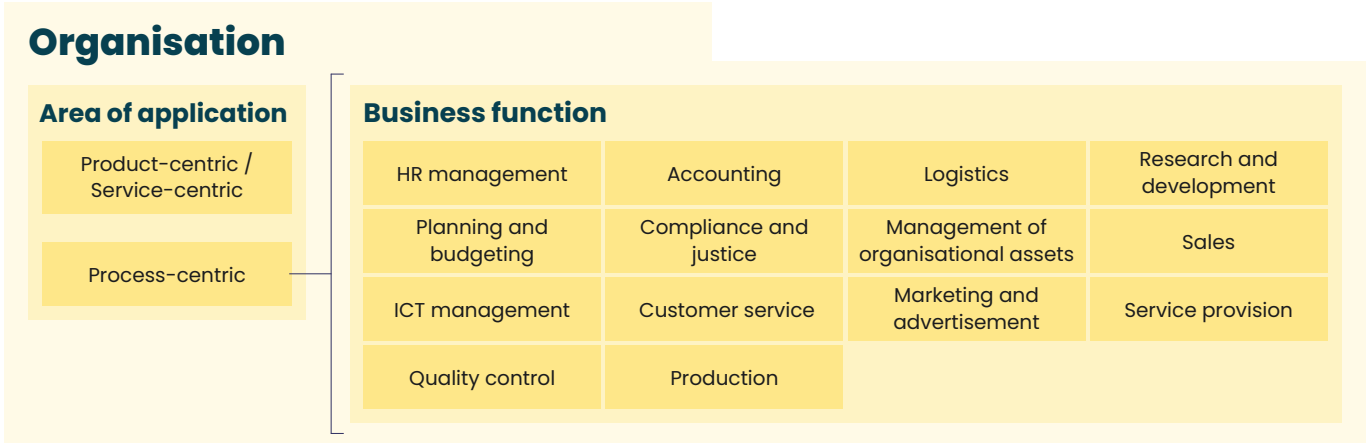
Business function

Focusing solely on process-centric use cases, the second category under the 'Organisation' dimension provides a closer look into which business functions leverage AI. For the purposes of this research, we understand business functions as the activities carried out by a company to sustain its operations and meet its goals and objectives.

We distinguish between 14 business functions[11]:

- **Accounting -** Process of recording, classifying, summarising, and analysing the financial transactions and activities of the company.
- **Compliance and justice -** Process of ensuring that the company's operations comply with relevant laws, regulations, and ethical standards, and that the company is accountable in its internal operations and interactions with stakeholders.
- **Customer service -** Process of providing assistance to customers before, during, and after purchasing a product or service.
- **Human resource management -** Process of recruiting, selecting, training, developing, and managing the company's employees. This includes human resource planning, recruitment, performance management, professional development, compensation and benefits, and employee relations.
- **Information Communication Technology management -** Process of planning, implementing, and overseeing the information and communication technologies that enable and support the company's operations and objectives.
- **Logistics -** Process of planning, implementing, and managing the flow of goods, services, and information. This includes order processing, transportation, inventory management, warehousing, packaging and labelling, and tracking the status and location of products once shipped.

- **Management of organisational assets -** Process of acquiring, maintaining, upgrading, and disposing of company assets to maximise their value and minimise risks.
- **Marketing and advertising -** Process of promoting the company's products, services, and brand to attract and retain customers. This includes defining and managing the brand, planning and delivering promotional campaigns, promotional content creation, and market research to understand customer needs and preferences.
- **Planning and budgeting -** Process of forecasting the company's future financial position and allocating resources to achieve its goals and objectives.
- **Production -** Process of transforming the company's inputs (such as raw materials, labour, and capital) into products sold to customers. This includes production planning, implementation, and control.
- **Quality control -** Process of measuring, evaluating, and improving the quality and performance of the company's products, services, and processes. This includes quality assurance and control of both products and processes.
- **Research and development -** Process of generating new knowledge, ideas, and innovations to drive the company's competitive advantage and long-term growth. This includes ideation and exploration, applied research, intellectual property management, etc.
- **Sales -** Process of identifying, engaging, and converting prospective customers into paying clients. This includes processes such as sales prospecting, lead scoring, and negotiation.
- **Service provision -** Process of transforming the company's inputs into services provided to clients. This includes the planning, organisation, and management of resources and operations necessary to provide a specific service.



AI use case framework: Organisation

11 We developed this list of business functions by building on the taxonomy proposed in the 'OECD Framework for the classification of AI systems' (source: https://www.oecd-ilibrary.org/science-and-technology/oecd-framework-for-the-classification-of-ai-systems_cb6d9eca-en) and modelling it around our dataset of 40 AI use cases. The definition of each function is ours.

Dimension 2: AI system

Apart from the two categories concerning the role of AI use cases within the organisation, there are important categories of information that relate to the AI system itself. Our framework identifies three such categories, grouped under the framework's second dimension: 'AI system'. These categories provide insights into the AI system's capabilities, the environment affected by its output, and its maturity in the context of the use case in question.

Capabilities

The first category of the framework's second dimension provides insights into the types of tasks the AI system can perform. We distinguish between the following capabilities that AI system may have:

- **Goal-directed action -** The ability of an AI system to achieve specific goals autonomously, and where applicable, calling on tools at its disposal. Examples include scheduling calls and booking activities based on a given agenda, adjusting inventory levels to ensure effective stock management, or controlling a fruit-harvesting robot.
- **Recognition and detection -** The ability of an AI system to recognise or detect specific events, entities, or behaviours from analogue or digital environments. Examples include monitoring worksites to detect unsafe behaviours or identifying sentiments, opinions or emotions expressed in text, audio, or video data (sentiment analysis).
- **Generation -** The ability of an AI system to generate, transform, and respond to prompts with content such as text, audio, images, video, or code. Examples include summarising and translating text, engaging in conversations with users, producing and editing images and videos, writing code for programming tasks, or creating songs.
- **Optimisation -** The ability of an AI system to identify optimal values for variables, sequences of actions or strategies to achieve goals. Examples include planning navigation routes or scheduling timetables.
- **Prediction and forecasting -** The ability of an AI system to forecast the likelihood of future events or states of the world. Examples include predicting crop yields, the likelihood of machinery failures within a given timeframe, or how customers will behave under certain circumstances.
- **Simulation -** The ability of an AI system to create a digital approximation of an entity, process, environment, or scenario under study. Examples include creating a digital model of a worksite to plan remote interventions or simulating the functioning of an engine to test alternative design specifications.
- **Recommendation -** The ability of an AI system to suggest relevant information based on preferences, needs, and behaviour. Examples include supporting decision-making, recommending content for specific audiences, or enhancing customer experience through chatbots and tailored suggestions.

The capabilities listed are not mutually exclusive. A given AI system may exhibit multiple capabilities.

Understanding the capabilities characteristic of a given AI use case and how they can be exploited in a business context provides a basis to define objectives for its implementation, contributing to aligning the use of the technology to a company's business strategy. Understanding the capabilities of an AI system can also help companies identify and mitigate potential risks associated with the use of AI in a given context.

Environment

The second category under the 'AI system' dimension provides a high-level view on the type of environment that is influenced by the system's output. We distinguish between:

- AI systems that only influence the virtual environment. Examples include chatbots, virtual assistants, and gaming applications.
- AI systems that also influence the physical environment as a result of being integrated into larger cyber-physical systems. Examples include applications in domains such as robotics, self-driving cars, and smart homes.

In some cases, AI systems that interact with the physical world can pose specific adoption challenges. For instance, operationalising these systems likely requires investments in bespoke infrastructure to support their functioning.

Readiness Level

The third and final category under the 'AI system' dimension provides information about how 'ready' for deployment an AI use case is relative to a specific business context. In this respect, we distinguish between the following 'readiness levels':[12]

- **Hypothetical -** The development of the AI system has not yet started and has only been theoretically proposed as a conceptual possibility.
- **Early development -** The development of the AI system has started but has not yet reached the proof of concept phase.
- **Proof of concept -** A version of the AI system has been validated in a test or live environment.
- **Operational -**The AI system has been successfully deployed in an operational context.

12 One of the most common frameworks for technological maturity is Technology Readiness Levels (TRLs). The TRL taxonomy, however, is not equally well suited for all types of technology. It is also too granular for the purpose of our research. For this reason, we used TRL as a starting point, simplifying and adapting it to the context of our research while maintaining coherence between the TRL framework and our approach.

Companies may be interested in considering a broad range of technological applications to identify AI opportunities in a business context, including some that are still in the research and development phase. For this reason, our analysis includes use cases that are not fully mature, including some that are purely hypothetical. However, it should be noted that our assessment of a use case readiness level is limited to a specific moment in time and may become outdated following further development and, eventually, operationalisation of that AI solution.

AI system

AI system capabilities

Goal-directed action	Prediction and forecasting
Recognition and detection	Recommendation
Generation	Simulation
Optimisation	

Environment

- Physical
- Virtual

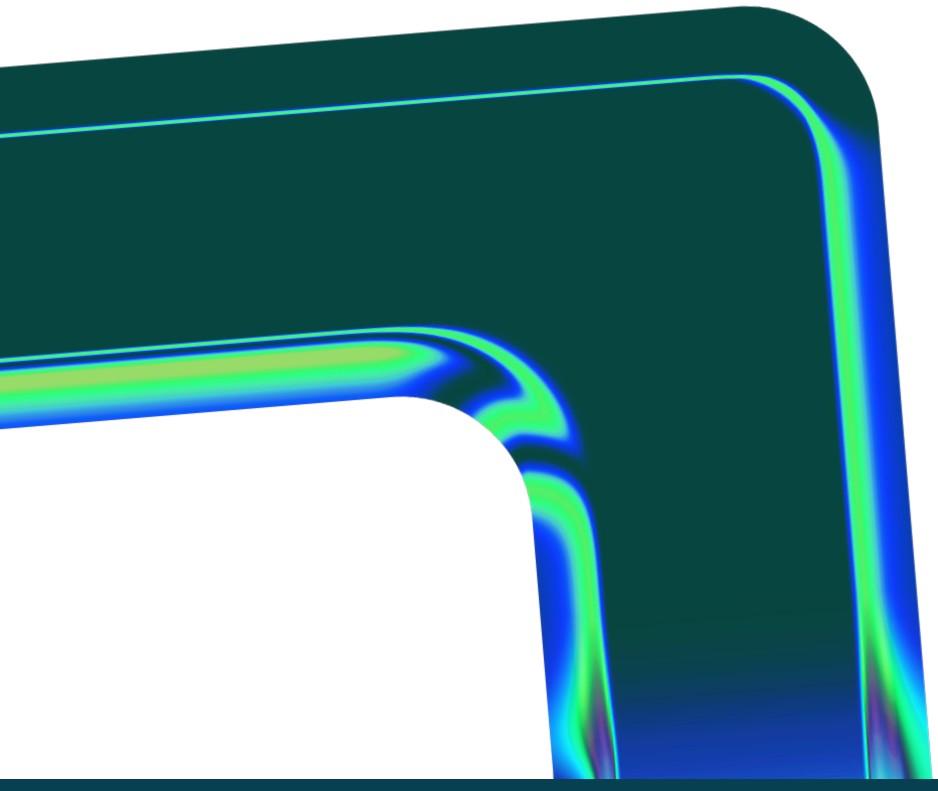
Readiness level

- Hypothetical
- Early development
- Proof of concept
- Operational

AI use case framework: AI system

Dimension 3: Data

Data are essential to support the effective development and deployment of AI. Considering the purpose of this framework, we focus only on the role of data in the deployment phase. The use of AI systems, in fact, can rely on different types of data, and their availability and quality will impact both the feasibility and outcomes of AI solutions. Furthermore, understanding what data are processed by an AI system applied in a specific context has important governance implications. In particular, if an AI system is trained on or takes personal data as input data, it will often raise important ethical and compliance questions regarding data protection. Our framework's third dimension – 'Data' – includes two categories of information that provide insights relevant to the types of data needed to deploy AI in a specific context and whether personal data are processed as part of the system's deployment.



Types of input data

The first category under the 'Data' dimension provides information about the format of data needed to deploy AI in a specific business context. We distinguish between the following formats of input data:

- **Audio –** 'Audio data' refers to various forms of sound, including the sound of human speech.
- **Visual –** 'Visual data' refers to images, videos, or other visual content.
- **Signal –** 'Signal data' refers to data describing physical phenomena or processes that carry information other than acoustic and visual signals. This includes various types of sensor readings, telecommunication signals, and biomedical signals such as EEG and ECG.
- **Numerical –** 'Numerical data' refers to data that take the form of continuous numerical values. Examples include lengths, volumes, and time durations.
- **Categorical –** 'Categorical data' refers to values that can be divided into discrete categories. These categories often represent qualitative characteristics or attributes. Categorical data cover a wide range of domains, including gender, customer satisfaction ratings, and clothing size.
- **Textual –** 'Textual data' refers to machine-readable sequences of characters, words, or sentences.
- **Geospatial –** 'Geospatial data' refers to data that describe a location on or near the Earth's surface. Usually, geospatial data combine information about a specific location, information about certain attributes observed in that location (e.g., objects or events), and information about the time at which the attributes are observed.

Understanding the types of data that an AI system takes as input is useful for businesses seeking to procure or develop similar solutions – this information can indicate the type of data a business might need to purchase or collect and the types of controls and audits that may be required. The different types of input data we identified refer to general, human-interpretable formats in which data can appear at the time of collection. It should be noted that, for this project, we decided to distinguish visual and audio data from signal data, even though they may be thought of in terms of 'signals'. This choice is motivated by the fact that computer vision and audition systems are increasingly common in industry applications and present distinctive characteristics and challenges compared to AI systems that process other types of signals.

Processing of personal data

Across the different types of input data mentioned on the previous page, the data used by AI systems may or may not represent personal data. In the second category of the 'Data' dimension, we therefore distinguish between AI systems that:

- process personal data;
- do not process personal data.

Developers and deployers of AI systems that process personal data – i.e., any information that relates to an identified or identifiable individual[13] – are required to comply with the legal requirements set by relevant data protection regulations and implement specific measures based on the circumstances in which the data processing takes place – e.g., based on the nature, scope, context, and purposes of the processing, and on the risks this poses to individuals' rights and freedoms. In the UK, the legal regime relevant to data protection is laid out by the Data Protection Act (DPA) and the UK General Data Protection Regulation (GDPR). Both regulations adopt a risk-based approach to data protection insofar as they require actors processing personal data to identify the risks that their processing activities pose to the data protection rights of affected individuals. For instance, if an organisation's processing of personal data is "likely to result in a high risk" to individuals' rights and freedoms, the UK GDPR and DPA require that organisation to perform a data protection impact assessment (DPIA) – i.e., a process to support the organisation understand the risks connected to its personal data processing and implement appropriate measures to mitigate those risks. Based on the ICO's Guidance on AI and data protection,[14] in most cases, the use of AI will involve a type of processing that is likely to result in a high risk to individuals' rights and freedoms and will, therefore, activate the legal requirement to perform a DPIA. Provided that the data protection implications of AI shall be assessed based on the contextual characteristics of each use case, knowing whether personal data are included in the data processed by a specific AI application is an important first step to assess whether the organisation deploying AI in that way is data protection compliant.

13 Examples of personal data include names, addresses, dates of birth; web-based data such as user location, IP addresses, cookies; Radio Frequency Identification tags; health and genetic data; biometric data; data on political opinions, sexual orientation, and racial and ethnic data.

14 Information Commissioner Office (2023). *Guidance on AI and data protection.* https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/artificial-intelligence/guidance-on-ai-and-data-protection/.

Finally, it is important to consider that not all data collected from individuals are automatically considered personal data. If they are fully anonymised and can no longer identify the individuals they originally referred to, their treatment will be exempt from the requirements of the DPA and the UK GDPR. Companies should exercise caution when anonymising data, however. First, the process of anonymisation is still considered processing of personal data. Second, if the individuals to which the data refer can be re-identified through any 'reasonably available means', then the data are not truly anonymised, and data protection requirements will apply.[15]

Data

Types of input data

Audio	Signal	Categorical	Geospatial
Visual	Numerical	Textual	

Processing of personal data

Yes	No

AI use case framework: Data

15 ICO (2022), *What is personal data*, https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/personal-information-what-is-it/what-is-personal-data/what-is-personal-data/.

Dimension 4: Economic sector

The last dimension of our framework captures information related to the economic sector in which the AI use case is deployed. Many AI applications can be relevant for multiple sectors, and some cut across all sectors of the economy. At the same time, the adaptable and versatile nature of AI technologies means that many use cases are specific to individual sectors. This framework highlights both the sector and sub-sectors to which each use case is relevant. With respect to AI applications that are potentially relevant for more than one sector, it is important to highlight that the specific socio-economic contexts in which AI is implemented will require bespoke strategic and governance approaches. As such, even for potentially cross-sectoral applications, our approach is to categorise AI use cases according to the specific characteristics of the concrete use we analyse.

Sector and sub-sectors

The four sectors we consider in this briefing series are:

- Agriculture, forestry and fishing
- Construction
- Creative industries
- Transportation and storage

In the UK, these sectors are characterised by a combination of high potential for AI-led productivity growth and a lower level of AI maturity[16] compared to other sectors such as telecommunications and financial services.[17] In other words, these are sectors where investment in AI can lead to comparatively higher productivity gains. Also, while strategically important to support the country's economy, these sectors share common challenges to AI adoption, namely high deployment costs, uncertain return on investment, and scarcity of technical skills.[18] As such, stimulating AI uptake in these sectors can contribute to addressing the UK productivity stagnation observed since the 2008 financial crisis[19] and aggravated by the COVID-19 pandemic in 2020-21.[20]

16 Maturity here refers to the number and scale of AI solutions implemented by firms.

17 InnovateUK (2024), *Bridging the AI divide. Innovate UK BridgeAI: a year in review*, https://iuk-business-connect.org.uk/wp-content/uploads/2024/07/DC028_BridgeAI_Report_240730.pdf.

18 Barclays (2021). cit.

19 Foote, A. (2015). *Labour productivity, UK: October to December 2015*. Office for National Statistics, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/bulletins/labourproductivity/octtodec2015#:~:text=UK%20labour%20productivity%20as%20measured,on%20its%20pre%2Ddownturn%20trend.

20 Hurley, J. et al. (2021). *Impacts of the Covid-19 crisis: evidence from 2 million UK SMEs*, Bank of England, https://www.bankofengland.co.uk/working-paper/2021/impacts-of-the-covid-19-crisis-evidence-from-2-million-uk-smes.

Each sector is comprised of a set of sub-sectors. A clear and objective mapping of sub-sectors is difficult to achieve without abstracting from the complexity characterising the range of economic activities that underpin each sector. Nevertheless, laying out the macro components of a sector structure can provide useful insights for the purposes of our research. For instance, information about the level of AI adoption in a specific sub-sector can help to identify existing market opportunities and pockets of the economy where policy interventions may be required. It is also important to note that a specific AI application can be relevant for multiple sub-sectors – e.g., an AI system that monitors safety on construction worksites. For use cases based on the example of a company using AI in a specific sub-sector, we refer only to that sub-sector. For use cases where we only had the example of a company offering an AI product or service that could be applied in more than one sub-sector, we referred to all relevant sub-sectors.

A more detailed discussion of the sectors and their respective sub-sectors can be found in the sector-specific briefs.

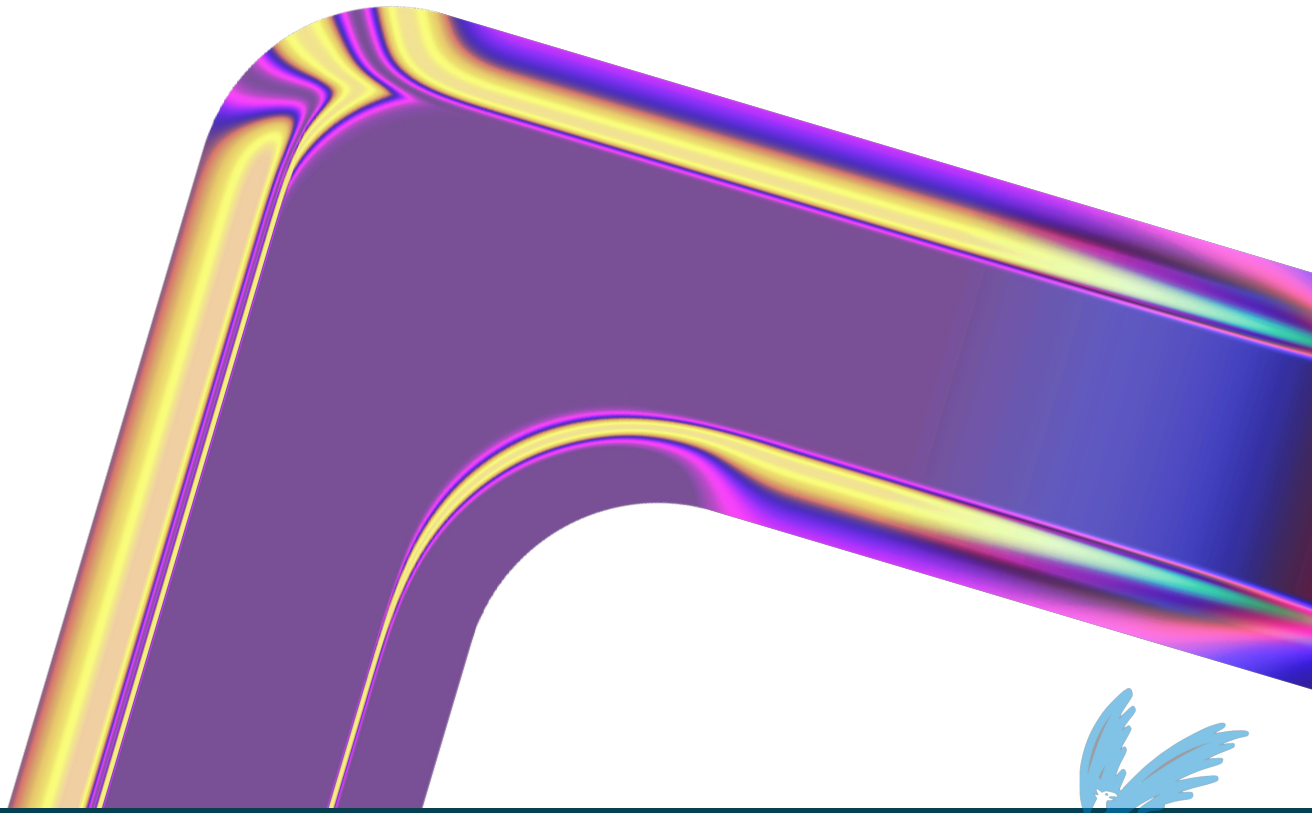
Economic sector

Sector	Subsector			
Agriculture, forestry and fishing	Crop	Animal production and hunting	Forestry and logging	Fishing and aquaculture
Construction	Buildings	Civil engineering	Specialised construction works	
Creative industries	Advertising and marketing	Architecture	Crafts	
	Design	Film, TV, radio and photography	IT, software and computer services	
	Museums, galleries and libraries	Music, performing and visual arts	Publishing	
Transportation and storage	Air	Rail	Road	
	Space	Water	Warehousing and support activities	

AI use case framework: Economic sector

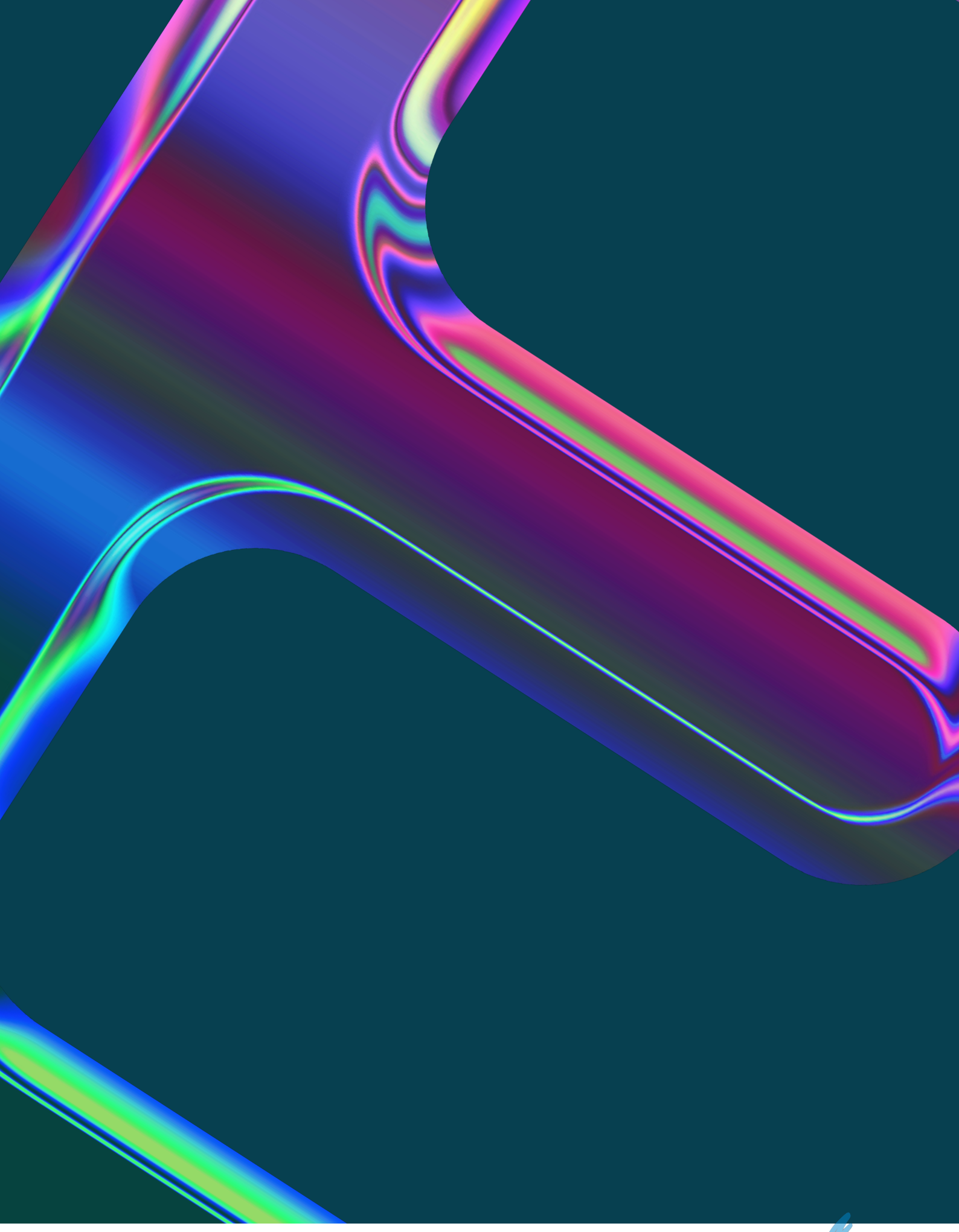
Limitations of the framework

While this framework offers a foundation to understand and assess specific business applications of AI, it is important also to acknowledge its limitations. Due to its very nature, this framework represents a simplified approximation of a more nuanced reality. Its goal is to offer curated information in a functional and accessible way rather than to lay out an exhaustive list of all information businesses should consider when thinking about possible ways of using AI in their domain cases. Furthermore, the scope of this framework is limited to publicly shared information. For example, we do not include information on categories such as the cost of investment for a specific use case or figures on concrete productivity gains related to a specific AI application. Although, in theory, very relevant for companies interested in adopting AI technologies, these types of information tend not to be publicly disclosed by businesses, and even if we had access to them, including them in the framework would require limiting the open nature of our work.



Conclusion

With AI set to enable new ways of generating value in nearly every industry, it is time for companies to think strategically about how to integrate AI into their organisations. However, the dizzying pace at which AI research is advancing and the hype attached to these technologies represent non-trivial challenges for companies trying to lay out a strategy to harness AI's potential. To truly reap the benefits of these technologies, companies need to start by carefully considering the range of available AI solutions and identify which one could most closely align with their business needs and objectives. Doing so requires a clear understanding of the various ways in which AI technologies can be operationalised in a business context, what is required to successfully do so, and what risks and challenges should be addressed. In this paper, we present a framework designed to support businesses in their AI adoption journey by laying out some of the key information to consider when assessing the suitability of an AI use case. The framework focuses on high-level categories of information that are relevant across industries and sub-sectors. Provided that each use case will also require context-specific considerations and present distinct challenges, we see this framework as a starting point that companies can build on and adapt based on case-specific needs and conditions. This first version of the framework for categorising AI use cases is exploratory and we will iterate on it by refining the existing information categories and expanding its scope based on the feedback that we will collect on this first version.



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