

strategy&

Part of the PwC network

An Approach to the AI Journey Design

**Perspective for Industrial
Manufacturing**

TABLE OF CONTENTS

AI adoption and related challenges	4
PwC Strategy& proposed approach	5
1. AI readiness assessment	6
2. Use cases catalog definition	7
3. Use cases preliminary evaluation	8
4. Business casing	9
5. Definition of implementation waves	11
6. Business engagement for prioritization refinement	12
7. Operating model and architecture definition	13
8. Roadmap design	16
9. Results measurement and continuous update	17
Conclusions	18

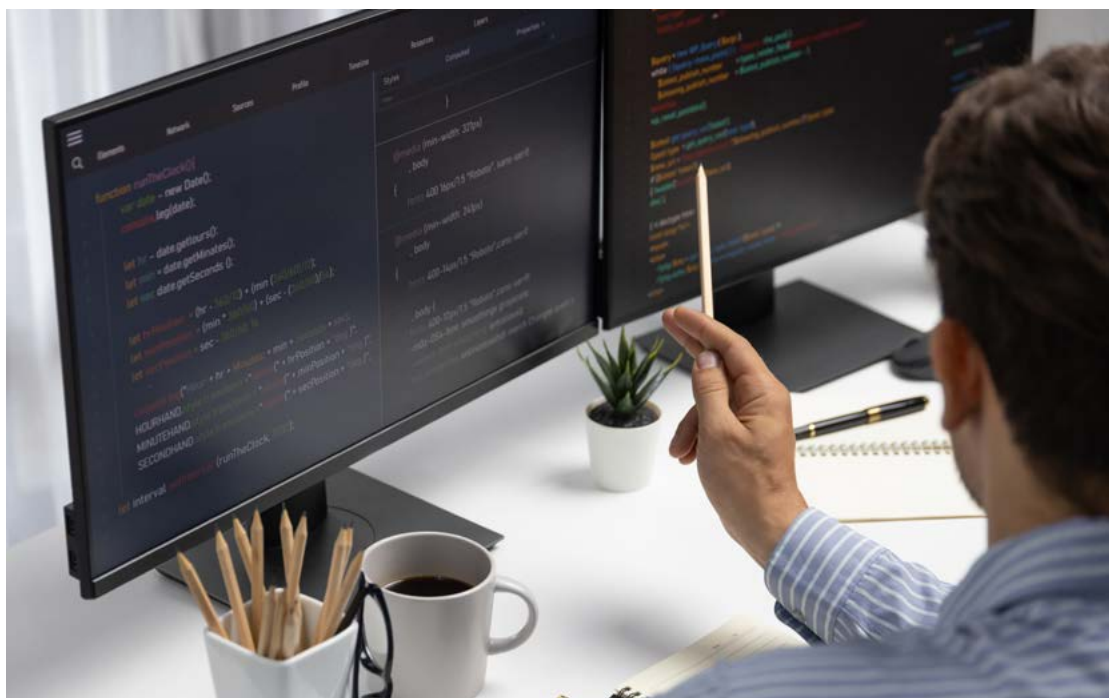
AI ADOPTION AND RELATED CHALLENGES

Since OpenAI's first public release of ChatGPT in November 2022, companies within diverse industries have progressively realized the potential that Artificial Intelligence (*both Generative and non-Generative*) has to generate economic returns and competitive advantage. 70% of CEOs¹ believe that Generative AI will significantly change the way that their companies create, deliver and capture value in the next 3 years. Indeed, new, more profitable business models are now possible leveraging AI-enabled capabilities, such as hyper-automation, product and content personalization, advanced-forecasting and human-like app interactions.

In order to harvest such returns, a gold rush towards AI is in act. Despite the promising potential, companies are facing common challenges along their AI journey, such as:

- Difficult conciliation between experimentations and business priorities.
- Bias towards individual productivity use cases, while missing out on other benefit areas, potentially with more transformative impact.
- Complex scale up of use cases from pilot stages to fully industrialized versions.
- Limited awareness of organization and technology gaps before starting the AI journey.
- Emergence of new risks and ad-hoc regulation (e.g. AI Act) related to AI.
- Need to coordinate AI initiatives with ongoing complex digital transformation programs.

To overcome such challenges, PwC Strategy& has developed a pragmatic and structured approach to an AI journey, described below by also referring to a recent experience supporting a large Italian industrial manufacturer.



1. From "PwC's 27th Annual Global CEO Survey", 2024

PWC STRATEGY& PROPOSED APPROACH

PwC Strategy&'s approach is articulated into 9 steps described below:

1. **AI Readiness assessment**, to identify potential constraints to AI adoption.
2. **Use cases catalogue definition**, to define a long list of applicable use cases.
3. **Use case preliminary evaluation**, to qualitatively rank use cases in terms of value and feasibility.
4. **Business casing**, to estimate the economic return from use cases.
5. **Definition of implementation waves**, to sequence the implementation of use cases according to a defined strategy.
6. **Business engagement for prioritization refinement**, to enlist executive sponsorship based on a shared view of expected benefits.
7. **Operating model and architecture definition**, to enable the execution and scaling of AI initiatives.
8. **Roadmap design**, to plan the release of use cases' and of supporting initiatives considering risks, capacity and financial constraints.
9. **Results measurement and continuous update**, to monitor use cases' performances and update the roadmap according to changing priorities.



1. AI READINESS ASSESSMENT

Capabilities across data, technology, operating model and talent need to be assessed beforehand to identify potential organization-wide constraints to adopting AI.

A more detailed analysis of such capabilities can be performed for each step of the value chain to identify the more mature areas for the potential prioritization of pilots.

For instance, the industrial manufacturer we supported revealed a high level of AI readiness within the customer service and supply chain management areas, while, at the same time, it underlined the lack of critical data collection capabilities in other areas. This evaluation enabled the company to prioritize initiatives to deliver the most immediate value.

EXHIBIT 1

AI readiness assessment from a manufacturing company

Value Chain	Product Design and Engineering	Custom System Design	Procurement Management	Production	Supply chain management	Sales, Marketing & Communication	Customer Service
Activities	Research and market analysis	Technical requirements analysis	Supplier research, evaluation and selection	Production planning	Warehousing (raw materials, wip, finished products)	Marketing content creation	Customer enquires handling
	Concept generation and prototyping	Simulation, testing and evaluation (system level)	Contract negotiation and management	Manufacturing, assembly and packaging process	Inventory management (raw materials, wip, finished products)	Marketing campaign management	Complaint management
	Simulation, testing and Evaluation (product level)	System Design	Procurement planning (i.e. material environment)	Health, safety assurance (inl environment)	Demand planning	Pricing, discounts and commercial conditions management	After-sales service & technical assistance
	Product Software & firmware development (e.q. IoT)	System ad-hoc components design and management	Procurement order management	Production quality assurance	Product order management	Sales targeting and forecasting	Feedback management
	Design for manufacturing	Tenders management	Material quality assurance and expediting monitoring	Third-party manufacturing management	Logistics and transportation planning	Customer relationship management	Customer training & education
	Codes, E-BOM, and product lifecycle management	BIM ¹ management (system level)	Supplier performance evaluation	Equipment maintenance	Transport management	Channel and territory management	Technical documentation & manuals management
	Intellectual property protection	Project planning	Category & spend management	Workforce management	Internal logistics management	Offers and quotation management	Reverse logistics

AI readiness High Medium Low

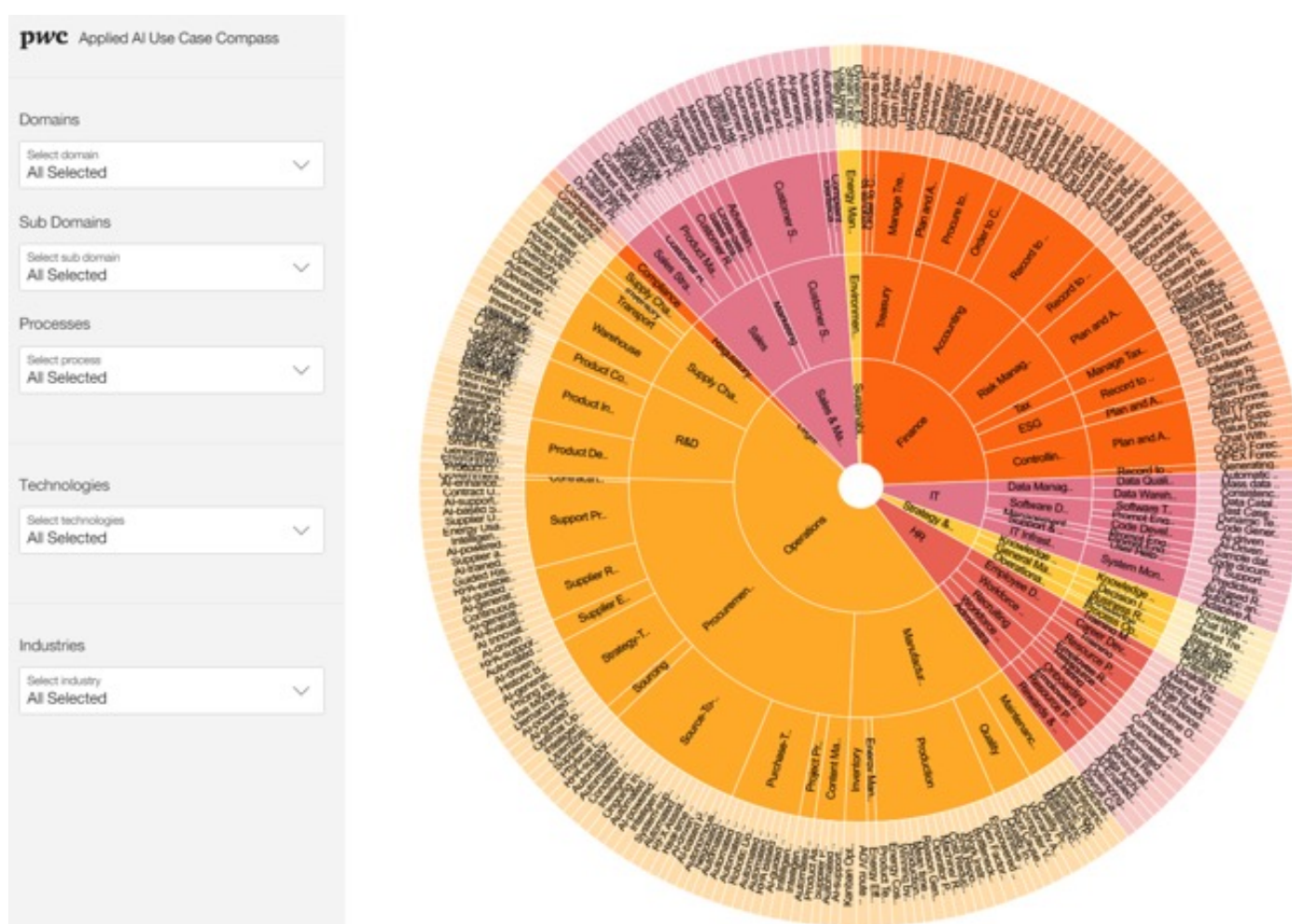
2. USE CASES CATALOG DEFINITION

A long list of potential AI use cases can be built pooling from diverse sources, including industry best practices, commercial software vendors' offering, leading edge industry and academic publications. Workshops also are helpful to generate new ideas and stimulate innovation. Such a catalog should cover the full value chain and commercial offering.

In our example, PwC Strategy& rapidly built a catalogue of 700 use cases relevant to the industrial manufacturer, by consolidating several sources, including the AI Use Case Compass created by PwC, which highlights a series of AI use cases categorized by industry and domain.

EXHIBIT 2

PwC AI Use Case Compass, allowing to filter use cases by applicable industry and high readiness areas



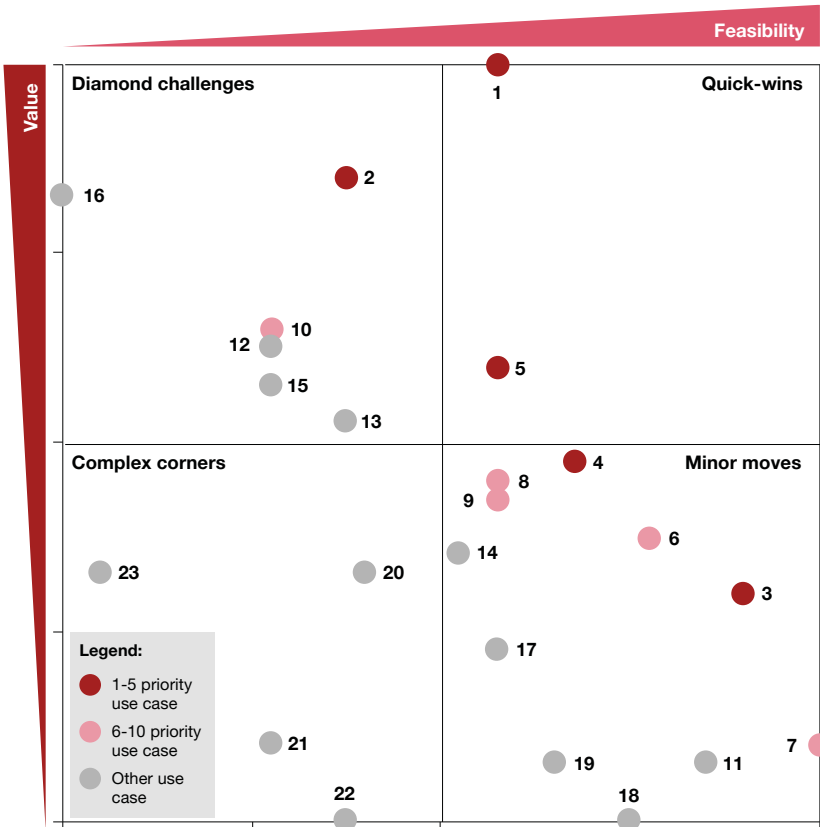
3. USE CASES PRELIMINARY EVALUATION

Value and feasibility must be evaluated for each use case to perform a first prioritization. At this stage, it's not necessary to come up with accurate economic estimations, while it's important to define the variables that describe use cases' impact (e.g. *increment in customer experience*).

Quali-quantitative methods can be helpful to evaluate use cases across each one of these variables. To achieve an accurate estimation, organizations can leverage industry benchmarks, best practices and technology and industry observatories. Experiences from other industries are also relevant as some use cases may be comparable (e.g. *customer service chatbot*).

Applying this method, PwC Strategy& prioritized the top 10 use cases for the industrial manufacturer, based on their feasibility, potential impact and overall contribution to the specific company's needs.

EXHIBIT 3
PwC Value and Feasibility Matrix – each numbered dot represents a specific use case



4. BUSINESS CASING

All prioritized use cases shall be profitable investments; therefore, it is crucial to estimate their economic returns. Additionally, such exercise provides further value, as it:

- Supports and confirms use cases prioritization.
- Creates accountability around related business units and functions.
- Helps to shape better business requirements (*therefore a more successful implementation*), as it requires the organization to clearly define the value levers (*e.g. reduction of time spent performing an activity, increase in the number of sales*) from which the economic return is expected.

The definition of value levers is particularly important, as the same use case can be implemented e.g. to reduce costs and/or to increase revenues. Depending on the actual goal that is pursued, the requirements for the use case might differ (*e.g. a chatbot for customer technical assistance may be used to expand the business of an industrial player into new countries, rather than to reduce the existing workforce; hence the support for multiple languages may a strong requirement*). This activity requires a strong engagement of business units and functions to be successful.

Once the economic value has been estimated for select use cases, it is useful to summarize the results grouping the use cases by business units/ functions and by affected economic KPIs (*e.g. cost of personnel, revenue from a certain product*). Such representation allows to answer 2 key questions:

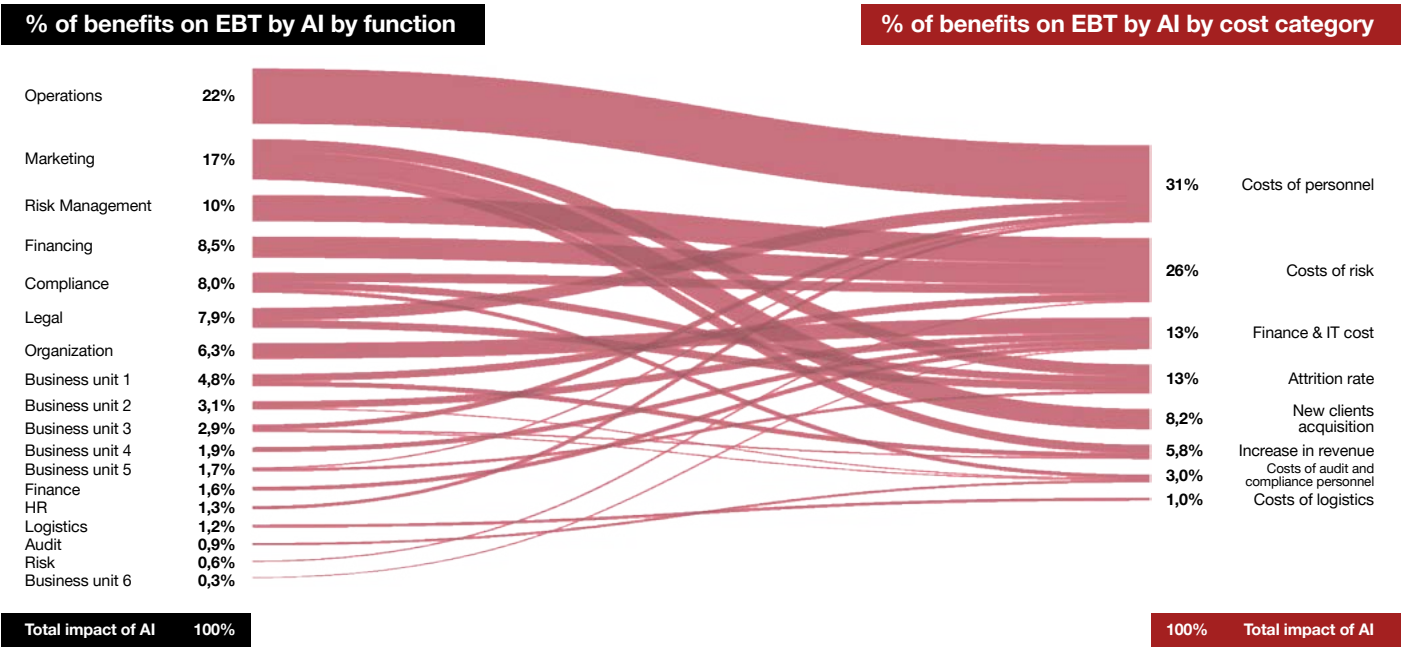
- Is AI providing a relevant support to the key business goals which are a priority for the company (*e.g. personnel cost decrease, revenue increase from online sales*)?
- Are there strategic organizational areas which seem to benefit less from AI?

Importantly, this last question can trigger a root cause analysis of the factors hindering innovation into strategic organizational areas, ultimately allowing to launch further initiatives to unlock additional value.

In our example, most of the value from the use cases prioritized by the industrial manufacturer would come from cost-reduction initiatives, mainly within operations. This is a common pattern for organizations at the beginning of their AI journey. Indeed, such organizations often prefer to experiment with such new technologies in “safe” back-office areas before implementing AI applications that are e.g. customer-facing. However, the analysis of the potential benefits of AI, by economic KPI, stimulate the systematic removal of the obstacles for broader adoption in all performance areas.

EXHIBIT 4

AI use cases economic value by business function and by economic KPI



5. DEFINITION OF IMPLEMENTATION WAVES

Once the short list of the top use cases is identified, their implementation can be sequenced based on additional criteria, such as frontloading those that either:

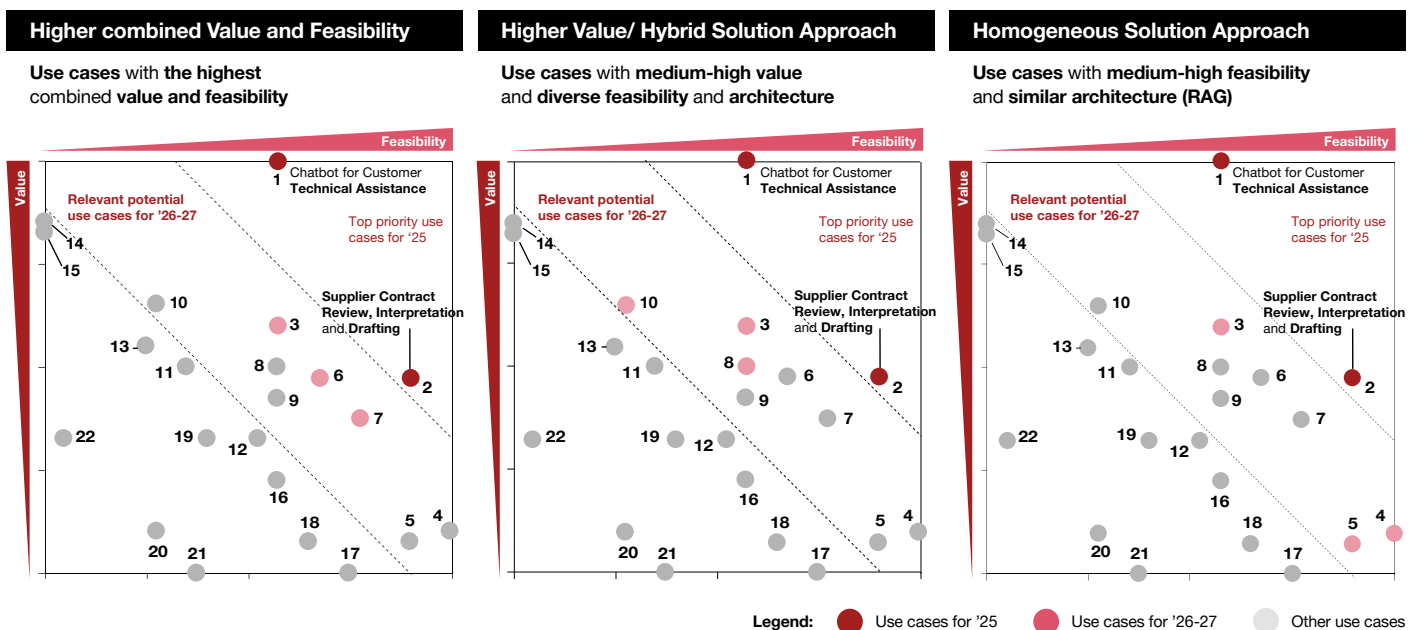
- Allow to engage a broad set of diverse business functions / units.
- Adopt the same technological architecture, to maximize implementation synergies.
- Focus on the same business domain (e.g. *transformation of the entire marketing campaign domain*), to accelerate the transformation there.

Each criterion results in a different sequence (“wave”) for implementing the use cases. The alternative “waves” can be discussed with business counterparts and C-levels to create a shared plan of action.

For example, the manufacturing company, once the top use cases by “feasibility vs. value” were selected, evaluated three alternative “scenarios”. Ultimately, it selected the scenario frontloading use cases using a common “RAG²” architecture, as this allows to build on the expertise of previous developments, focused on the most AI-ready areas and maximize an efficient use of the resources, all of which were considered key by the management.

EXHIBIT 5

Example of 3 potential approaches that were evaluated to select the first 5 use cases



2. RAG = Retrieval Augmented Generation

6. BUSINESS ENGAGEMENT FOR PRIORITIZATION REFINEMENT

It's crucial, for successful implementation, to enlist executive sponsorship for the use cases to be implemented. This requires, ideally, the buy-in on the sequence of implementation, an in-depth discussion around the expected benefits, the subsequent feeding to individual/team targets and MBOs.

For the manufacturing company, a crucial element for management buy-in was building a business case for each priority use case, setting quantitative KPIs and financial impacts (e.g. *marketing FTE reduction vs. customer acquisition*), while clarifying the intended value drivers and profit contributions, market benchmarks and key success factors. The quantitative impacts were also fed in the annual planning and budgeting cycle.



7. OPERATING MODEL AND ARCHITECTURE DEFINITION

The success of an AI journey hinges on the setup of an effective AI Operating Model, defining key aspects such as how the business and technology teams work together, how key decisions are taken, how key operational activities are performed, which data and technologies are used. Some of these aspects (*e.g. key committees, planning processes, talent acquisition and management*) may have already been defined, if the company has previously conducted an effective digital transformation program.

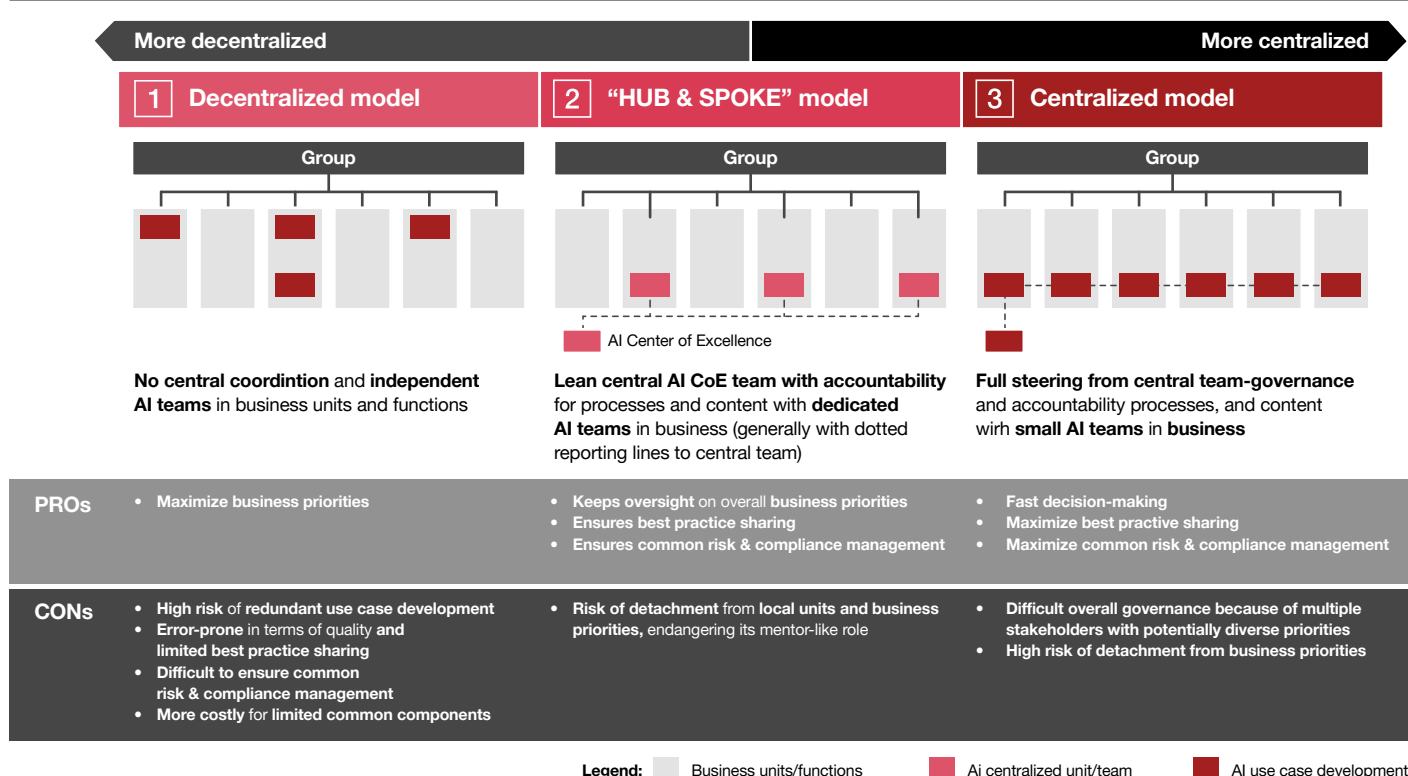
Other aspects – such as technology stack, talent and risk management requirements – have AI-specific needs that necessarily require a rethinking of at least some portions of the model, leveraging on industry best practices and archetypes.

In the case of the industrial company, for instance, several aspects were defined.

Firstly, an “hub & spoke” archetype was adopted to organize AI activities, and an AI Center of Excellence (CoE) was introduced. According to such archetype, AI CoE guided key decisions regarding architecture, infrastructure, technologies and development standards, both for AI activities specifically and data management activities more generally, while development activities were progressively decentralized to dedicated teams within the business units.

EXHIBIT 6

3 archetypes of how to organize AI activities at scale



Additionally, a need for a robust Responsible AI framework was identified, to guarantee alignments with regulatory standards and ethical considerations. This framework was defined by a multidisciplinary team (*including business units, AI specialists, IT, risk management functions*) and was approved by a Committee which closely coordinates with the pre-existing Digital Transformation Committee.

EXHIBIT 7

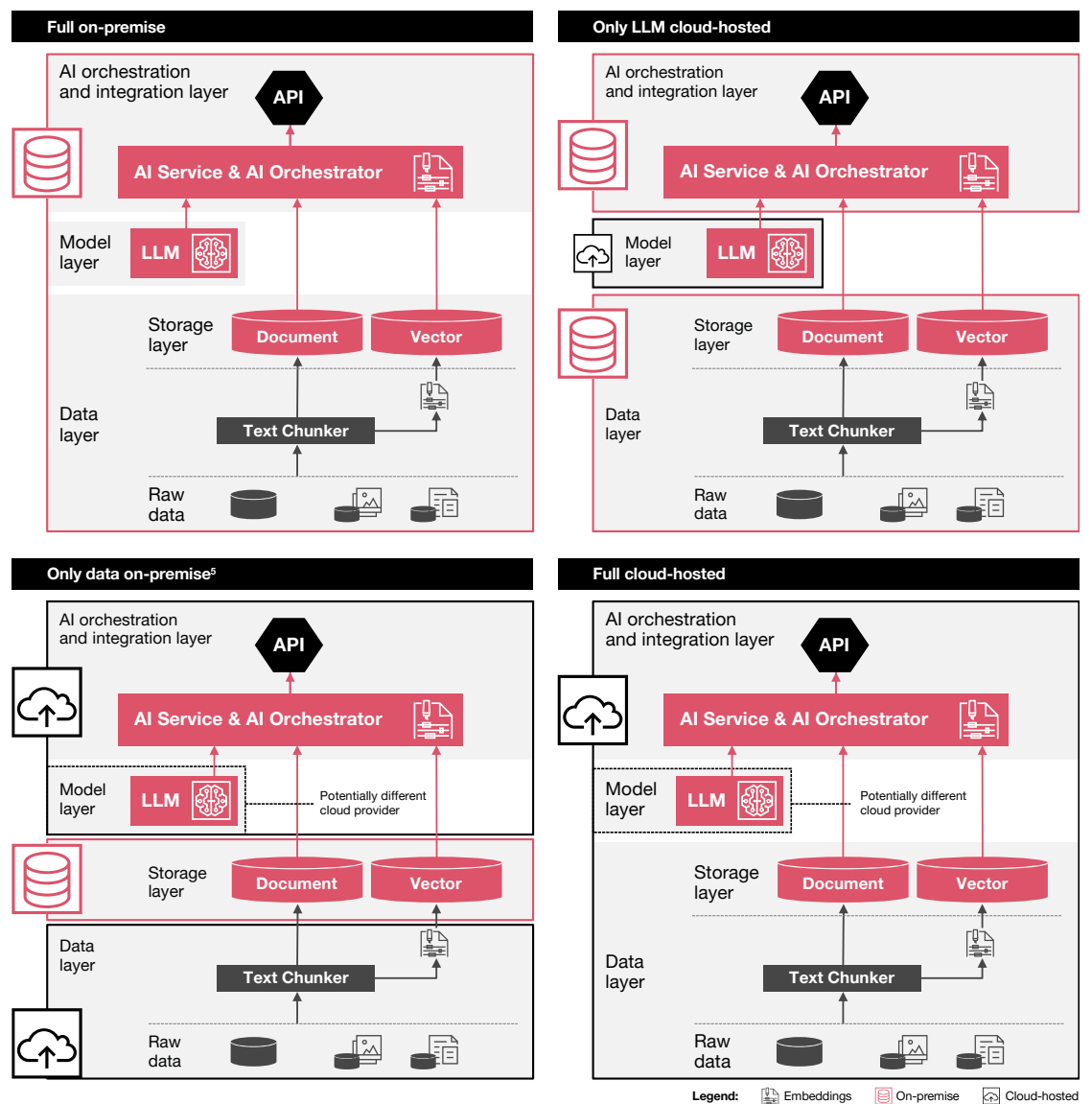
Responsible AI framework - from PwC Strategy& experience (simplified)



Finally, a target AI architecture was defined, which had to balance high scalability (e.g. to allow inference and training, especially for LLMs³), economic efficiency and lock-in avoidance (e.g. to account for the fast-paced evolution of AI reference technologies).

The selected architecture was in fact fully cloud-hosted, and designed to be flexible in sourcing LLMs, potentially hosted by different providers. Monitoring systems to control cloud resource consumption – critical for such applications – were implemented. Finally, it combined PaaS solutions with forward looking assessments of vendor capabilities to minimize lock-in risks.

EXHIBIT 8
Responsible AI framework



3. LLM = Large Language Model.

8. ROADMAP DESIGN

A comprehensive roadmap shall be built, including use cases development, operating model and architecture setup, profile hiring and additional initiatives to increase the AI readiness (e.g. *setup of a data platform*).

Such roadmap shall include a progressive deployment of the target initiatives, including pilots and internal pre-releases to properly minimize risks of applications such as public chatbots. Operating model and architecture implementation release and talent hiring will also be progressive, with focus on what's needed by the first pilots.

In the example mentioned, two AI use cases were slotted for implementation in Year 1, along with their respective enablers (e.g. *setup of the target architecture and of a results measurement system*). Also, other initiatives were launched in Year 1, all meant to enhance the company data and AI readiness and enable a subsequent scale up of AI activities (e.g. *refresh of the data strategy, setup of a data platform, design of a data governance framework*).

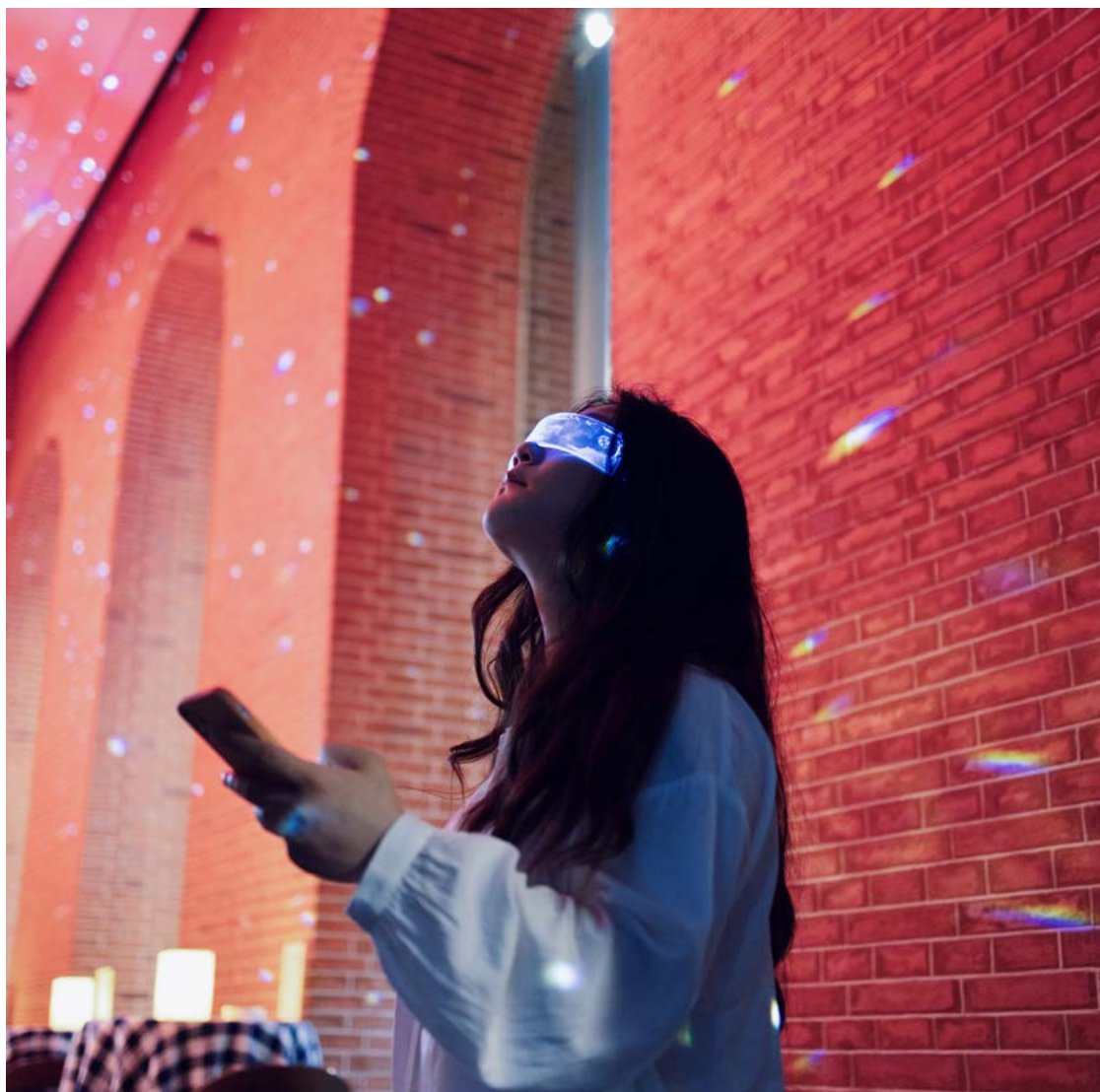
More complex initiatives (e.g. *expansion of the CoE with a talent hiring program*) were programmed for Years 2 and beyond, to accompany the second wave of use cases.



9. RESULTS MEASUREMENT AND CONTINUOUS UPDATE

To minimize AI adoption risks and to create consensus around AI investments, it's crucial to setup a robust results measurement system. The results shall be the basis to decide, for instance, a scale-up of pilots, a change of priorities, the fine tuning of the operating model. To this end, each use case should have KPIs aligned with the expected benefits defined during the evaluation phase.

Also, retrospective moments should be systematically conducted with the management to discuss the results, mutated business priorities or changes in AI technologies. The ultimate goal is to verify and update regularly the list of priority use cases and the overall roadmap. For example, the manufacturer in the example, aims to revisit and adjust the priority use cases, roadmap and investments on a quarterly basis.

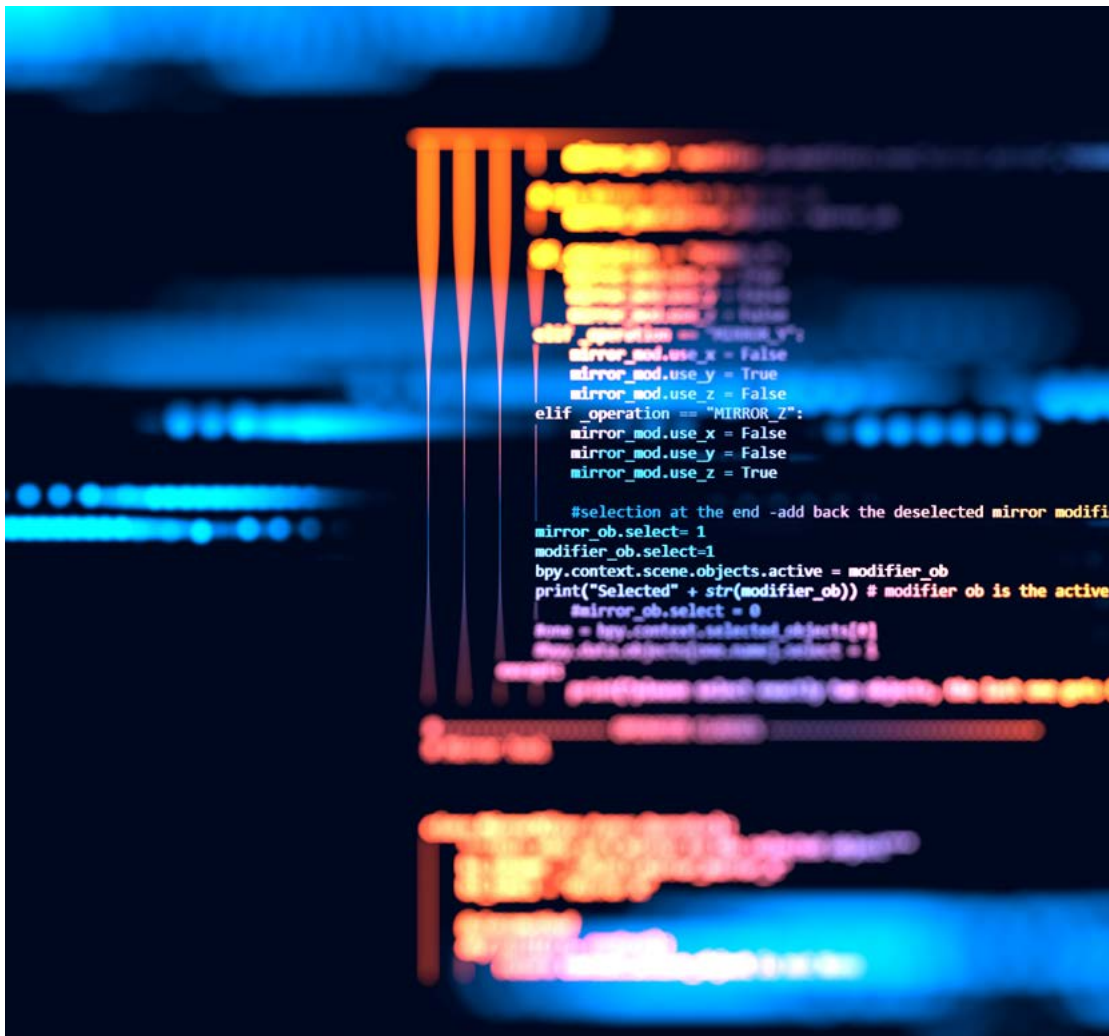


CONCLUSIONS

PwC Strategy&'s pragmatic approach is designed to address the key challenges in adopting AI, aiming to make the AI transformation business relevant, to generate tangible impacts and financial results in a contained timeframe, to enable a progressive scale up with updated AI activities and capabilities.

While AI is clearly a foundational part of future business models, substantial effort is required to adopt and leverage AI successfully and at scale.

Yet, this should not deter companies from starting this journey, as even organizations with more limited budgets can reap large benefits from clarifying priorities with a structured approach and from defining a clear and progressive path. This is the most fundamental step to embrace the AI transformation, to harvest tangible economic returns and ultimately to build a sustainable competitive advantage.



Strategy&

Strategy& is a global strategy consulting business uniquely positioned to help deliver your best future: one that is built on differentiation from the inside out and tailored exactly to you. As part of PwC, every day we're building the winning systems that are at the heart of growth. We combine our powerful foresight with this tangible know-how, technology, and scale to help you create a better, more transformative strategy from day one.

As the only at-scale strategy business that's part of a global professional services network, we embed our strategy capabilities with frontline teams across PwC to show you where you need to go, the choices you'll need to make to get there, and how to get it right.

The result is an authentic strategy process powerful enough to capture possibility, while pragmatic enough to ensure effective delivery. It's the strategy that gets an organization through the changes of today and drives results that redefine tomorrow. It's the strategy that turns vision into reality. It's strategy, made real.

Contacts

Stefano Bianchi

Partner, PwC Strategy& Italy
+39 334 6245193
stefano.bianchi@pwc.com

Massimo Iengo

Partner, PwC Italy
+39 348 0470336
massimo.iengo@pwc.com

Emiliano Luzietti

Director, PwC Italy
+39 348 265 7794
emiliano.luzietti@pwc.com

Gerolamo Di Salvo, Manager at PwC Strategy& Italy, also contributed to this report.

www.strategyand.pwc.com/it

