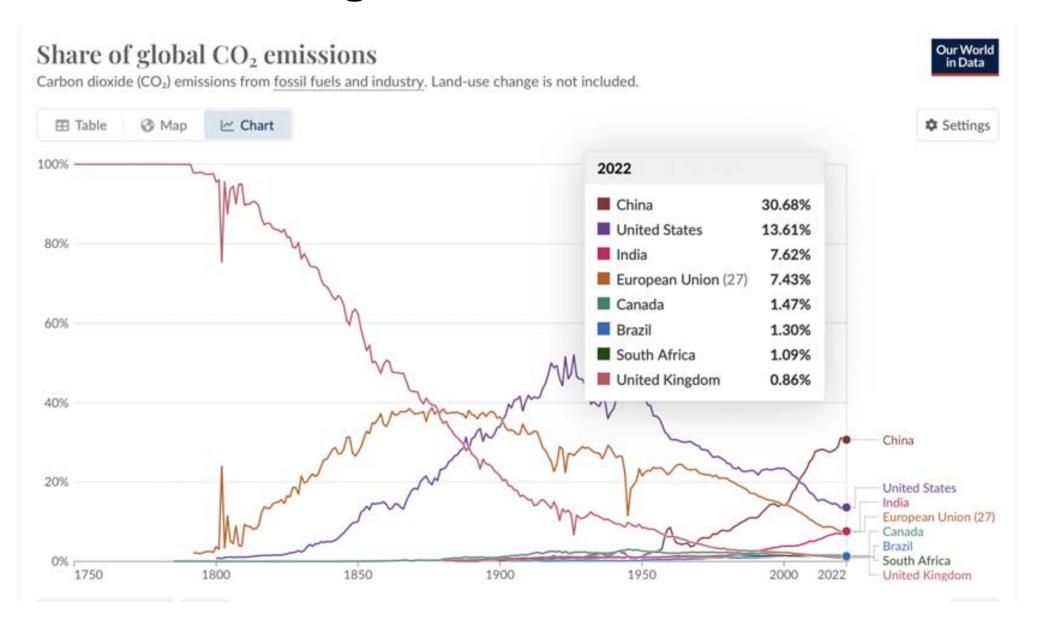
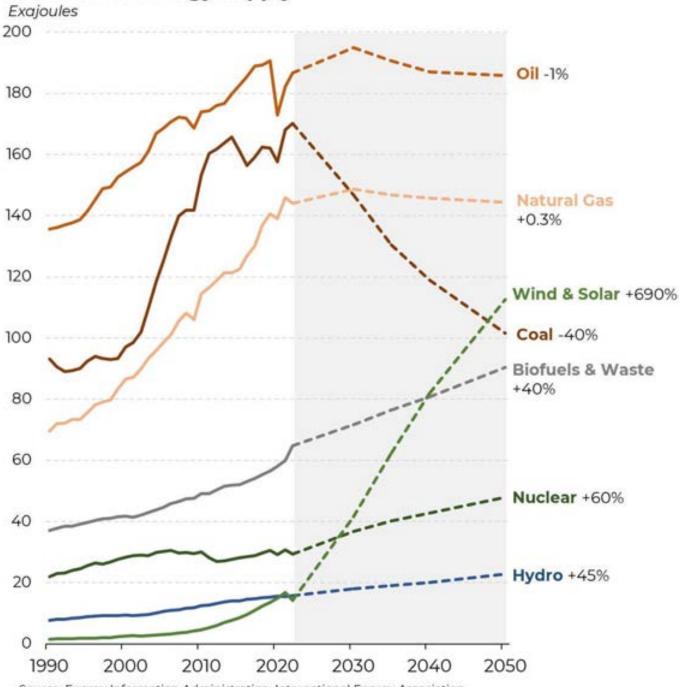
EU's share of global CO2 emissions: 7.4%



World Total Energy Supply



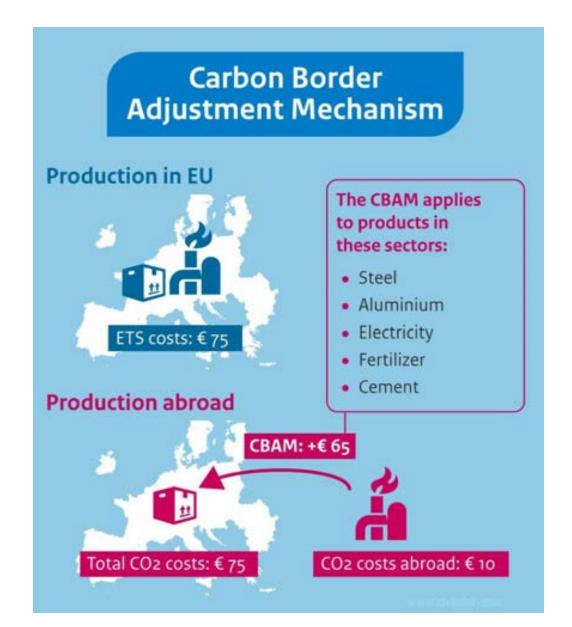
Next 25 years of energy mix

Source: Energy Information Administration, International Energy Association

CBAM: a mechanism of "green protectionism"

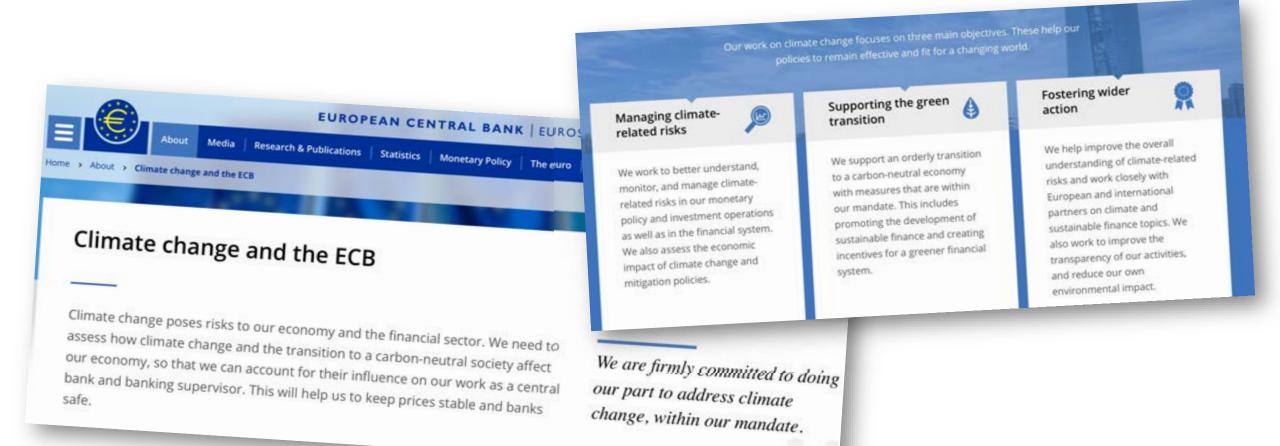
CBAM is open to and incentivises decarbonisation efforts in third countries and favours international coordination thanks to a five-tier system:

- 1. Actual Emissions methodology
- Countries applying EU ETS or linked to it will be excluded
- Deduction of the carbon price paid in third countries from the adjustment on imported products
- 4. International agreements on how to take into account carbon price
- 5. Special rules on electricity for countries whose electricity market is "coupled" with the Union internal market for electricity



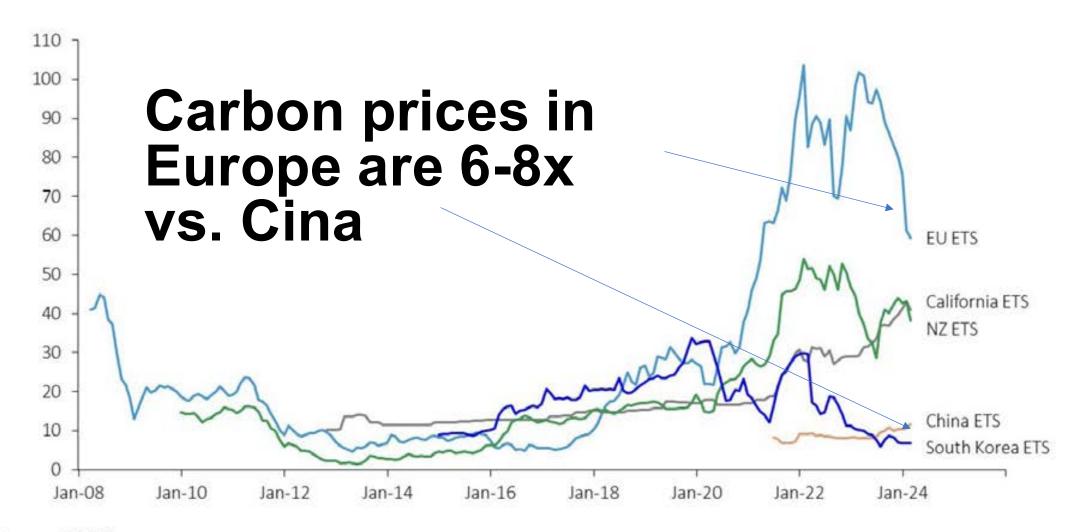
Money will have a «carbon price»

First and alone, the ECB has included climate change targets in its monetary policy mandate



Development of global carbon prices

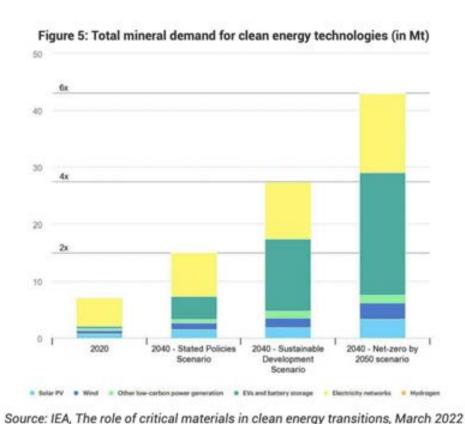
ETS historical price developments, USD per tonne

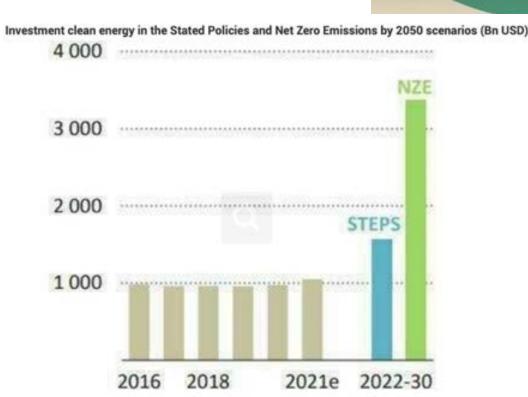


Source: Rystad Energy, 2024.

«Greenflation» is here to stay

Internalizing negative environmental externalities will impact investments, debt and consumer prices





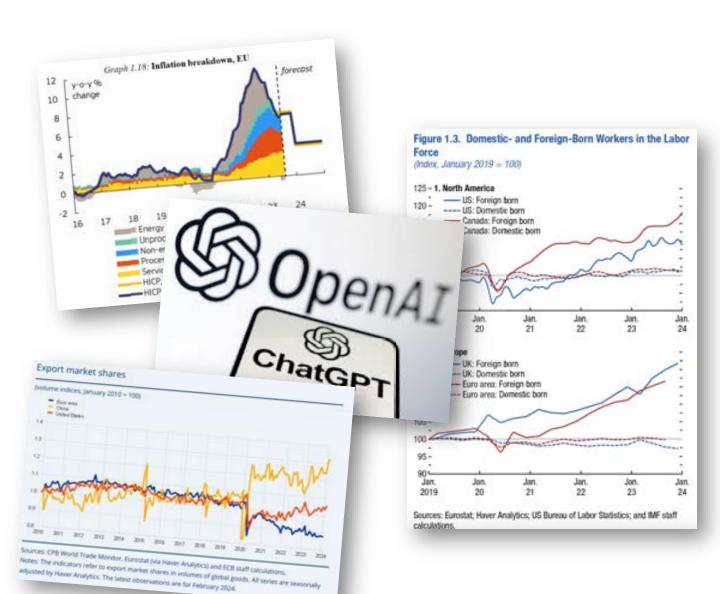


Threatens The Sustainable Society

Source: World Energy Outlook 2021, (Oct. 2021) IEA

THE GEOPOLITICAL, MACROECONOMIC, AND TECHNOLOGICAL DRIVERS OF CHANGE

- A post-global world
- A post-green world
- 3. A post-digital world
- Challenges and opportunities for CIOs

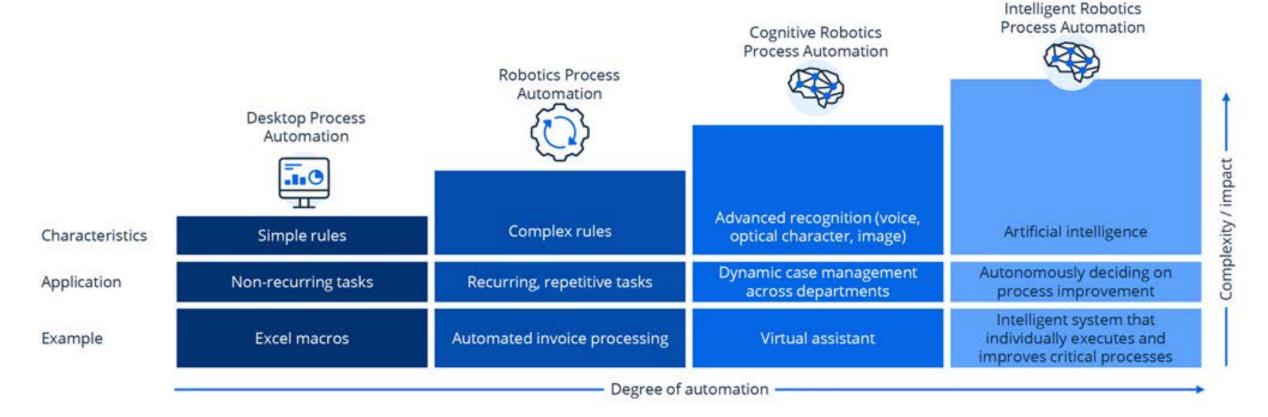


NEXT CHALLENGE, INDUSTRIAL ARTIFICIAL INTELLIGENCE...

Al can autonomously decide process improvement

Robotic process automation (1/3)

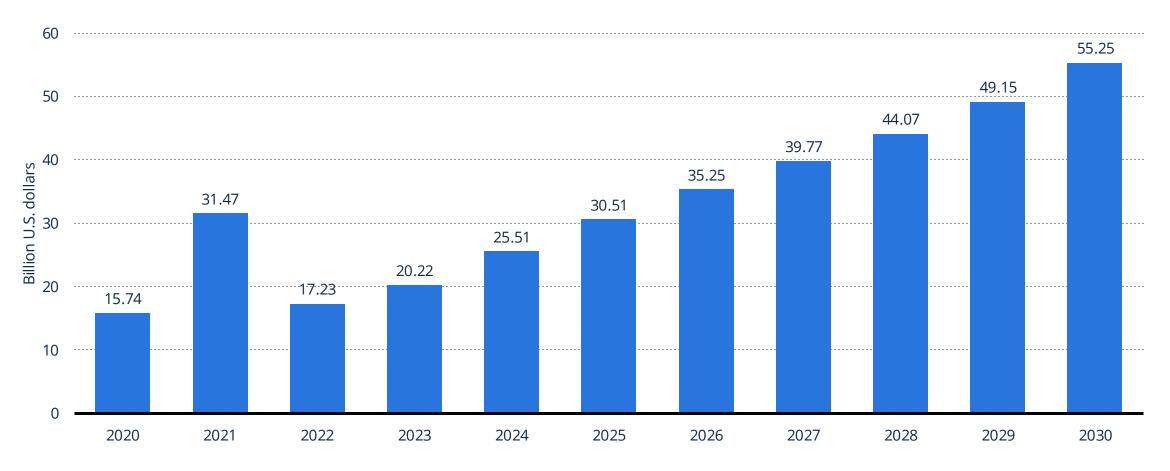
Stages of robotic process automation





Size of the autonomous and sensor technology market globally from 2020 to 2030 (in billion U.S. dollars)

Autonomous & sensor technology market size worldwide from 2020-2030





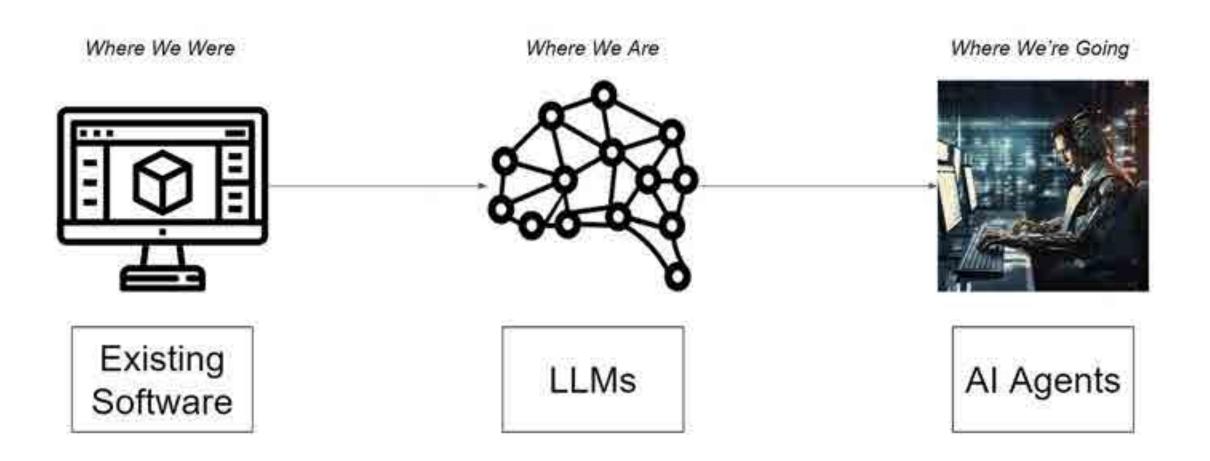
Carlo Alberto

Building the Agentic Organization with Generative Al

Exploring how Generative AI can transform traditional organizations into agentic entities, empowering employees and enhancing decision-making across various sectors.



AI AGENTS - FROM SOFTWARE TO AUTONOMOUS SOFTWARE



Understanding Agentic Organizations

Exploring the Shift in Organizational Dynamics

Defining Agentic Organizations

Agentic organizations represent an innovative model where autonomous AI agents not only provide insights but actively engage in decision-making and execution. These AI agents are designed to self-learn, self-improve, and self-coordinate, which leads to enhanced operational efficiency and adaptability.

The Technological Imperative

The rise of generative AI has revolutionized the landscape from merely predictive analytics to action-oriented AI, prompting organizations to adopt more agile and responsive structures. This technological evolution serves as a driving force behind the emergence of agentic organizations.

Autonomous Agents in Action

Large Language Model (LLM)-powered autonomous agents are now capable of reasoning, planning, and executing tasks independently. Their ability to act autonomously presents significant opportunities for organizations to streamline operations and improve decision-making processes.

Market Pressures and Changes

In today's fast-paced business environment, organizations face immense market pressure to accelerate decision-making, automate critical processes, and reduce costs. Agentic organizations are well-positioned to address these challenges through their inherent agility and efficiency.

Implications for CIOs

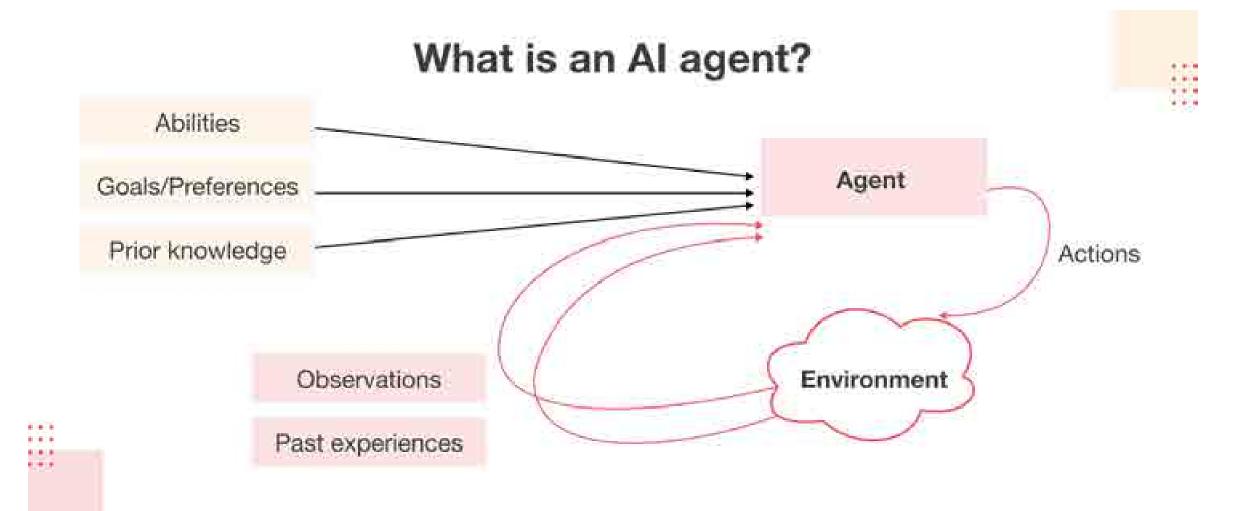
CIOs are increasingly required to transition from traditional IT governance models to frameworks that prioritize AI-driven enterprise design. This shift necessitates a rethinking of technology leadership roles to effectively integrate human and AI collaboration in business processes.

The Role of IT Departments

In agentic organizations, IT departments must evolve to orchestrate the collaboration between AI and human workers. This involves ensuring that AI deployment is ethical, efficient, and scalable, thus maximizing the benefits of AI technology across the organization.

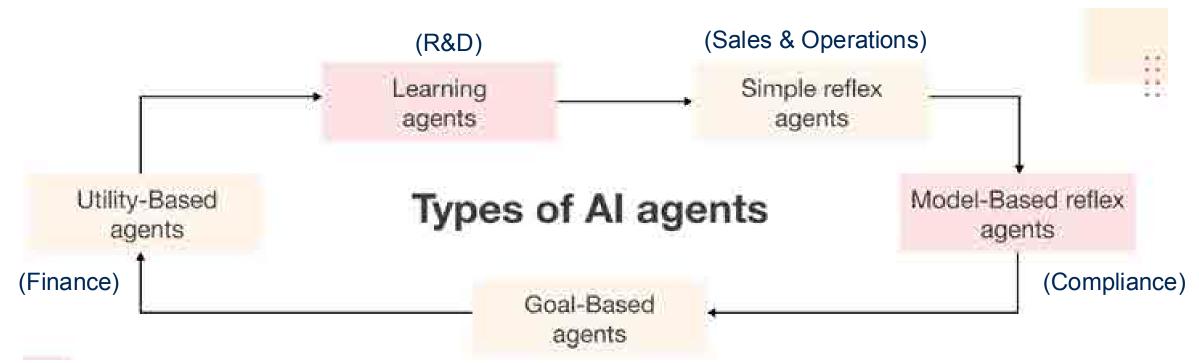
HOW «INTELLIGENT AGENTS» WORK...





THE ORGANIZATIONAL DESIGN OF «AI AGENTS»





(Entrepreneurship & General Management)

Cinque tipi principali di agenti Al:

- 1. Simple reflex agents sono programmati per rispondere a specifici stimoli ambientali sulla base di regole predefinite.
- Model-based reflex agents sono agenti reattivi che mantengono un modello interno dell'ambiente e lo utilizzano per prendere decisioni.
- 3. Goal-based agents eseguono un programma per raggiungere obiettivi specifici e intraprendere azioni basate sulla valutazione dello stato attuale dell'ambiente.
- 4. Utility-based agents considerano i potenziali risultati delle loro azioni e scelgono quello che massimizza l'utilità attesa.
- **5. Learning agents** eseguono tecniche di machine learning per migliorare il loro processo decisionale nel tempo.

Identifying AI Use Cases for Organizations

A Guide to Transformative AI Integration

Identify High-Value AI Use Cases

The first step in designing an agentic organization involves identifying high-value AI use cases across various business areas. This entails assessing where AI agents can significantly drive transformation, ensuring that these areas align with organizational goals.

Assess Business Areas for Al Integration

Evaluate different business areas to determine where AI can create the most impact. This assessment should focus on identifying operations that are ripe for automation and enhancement through AI capabilities, leading to increased efficiency and effectiveness.

Prioritize Based on Key Factors

Once potential use cases are identified, prioritize them based on return on investment (ROI), feasibility of implementation, and the organization's readiness for AI adoption. This strategic prioritization ensures that resources are allocated effectively to projects with the highest potential value.

Example in Manufacturing: Procurement Agents

In the manufacturing sector, AI-driven procurement agents can automate and optimize vendor negotiations. This not only streamlines the procurement process but also enhances decision-making speed and accuracy, leading to cost savings.

Example in Finance: Fraud Detection

AI technology can autonomously detect fraud patterns in financial transactions. By executing security protocols automatically, AI not only protects the organization from financial losses but also increases consumer trust and satisfaction.

Example in Customer Service: Virtual Assistants

AI-driven virtual assistants can handle 80% of customer interactions, providing immediate responses and support. This not only improves customer satisfaction but also allows human agents to focus on more complex queries, enhancing overall service quality.

Building a Modular Al Architecture

Key Steps in Designing an Agentic Organization

Core AI Stack Definition

The foundation of an agentic organization relies on a robust core AI stack, which includes large language models (LLMs), multi-modal AI capabilities, and reinforcement learning techniques. This stack enables autonomous adaptation, allowing the organization to respond dynamically to changing environments and user needs.

Implementation of Agentic Layers

Agentic layers are essential for enhancing organizational intelligence. These layers include an AI reasoning engine that simulates human-like thinking, workflow automation to streamline processes, and real-time data integration for informed decision-making. Together, they create a responsive and efficient organizational framework.

Human-in-the-Loop Mechanisms

To ensure effective collaboration between AI systems and human operators, it is crucial to establish human-in-the-loop mechanisms. These mechanisms define clear decision boundaries, specifying when human intervention is necessary. This balance enhances the reliability of AI outputs while preserving human oversight.

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BEYOND «HALLUCINATIONS»: TOWARDS «OBJECTIVE-DRIVEN AI»

Lytle Lecture 2023-2024

Objective-Driven Al

Towards AI systems that can learn, remember, reason, plan, have common sense, yet are steerable and safe

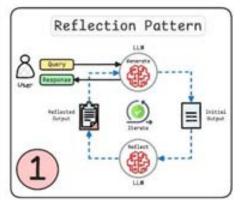
Yann LeCun

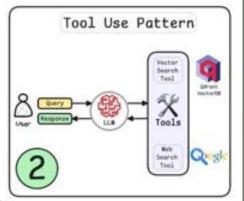
New York University Meta – Fundamental Al Research

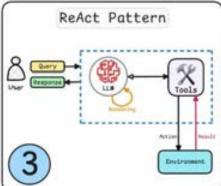
> University of Washington Lytle Lecture 2024-01-24

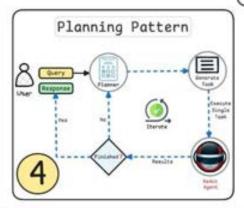


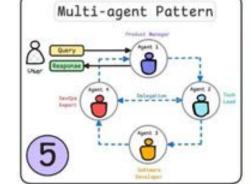
Agentic Design Patterns



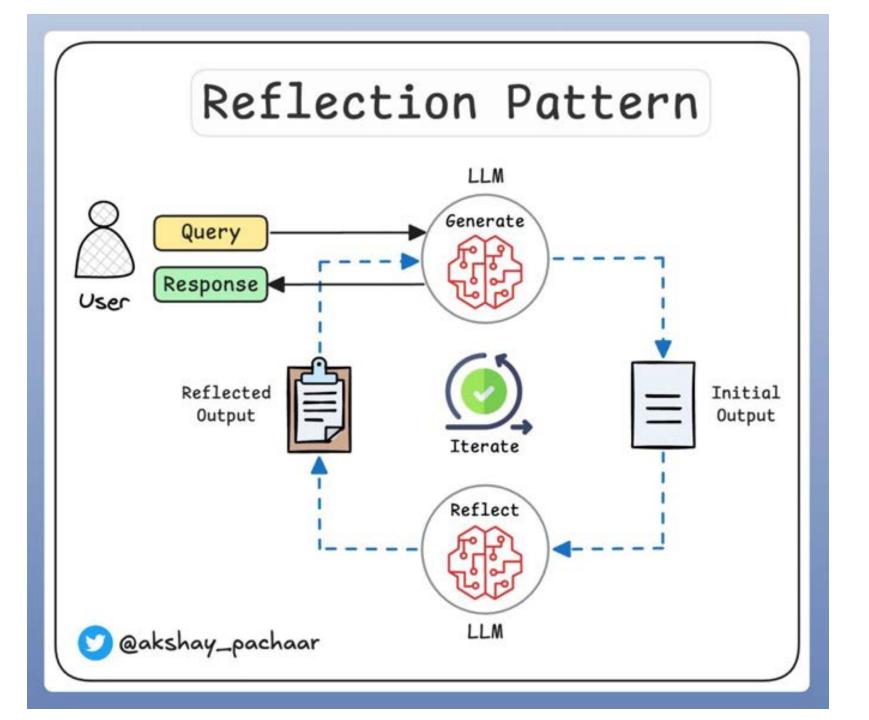




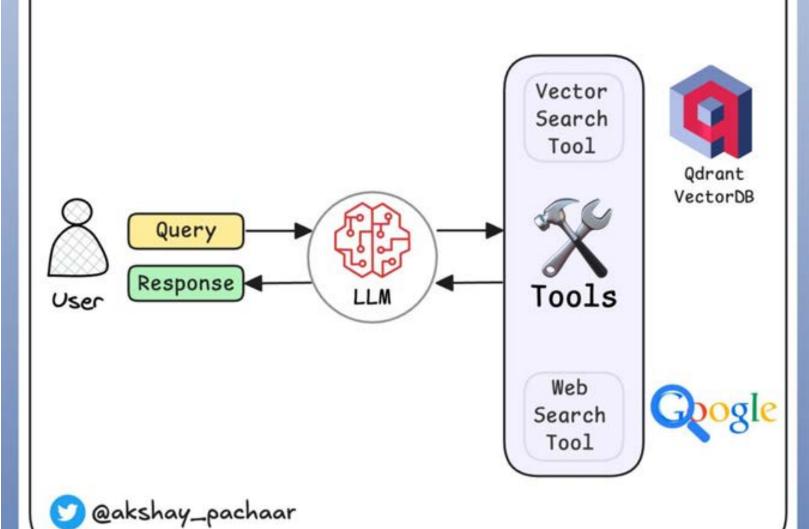


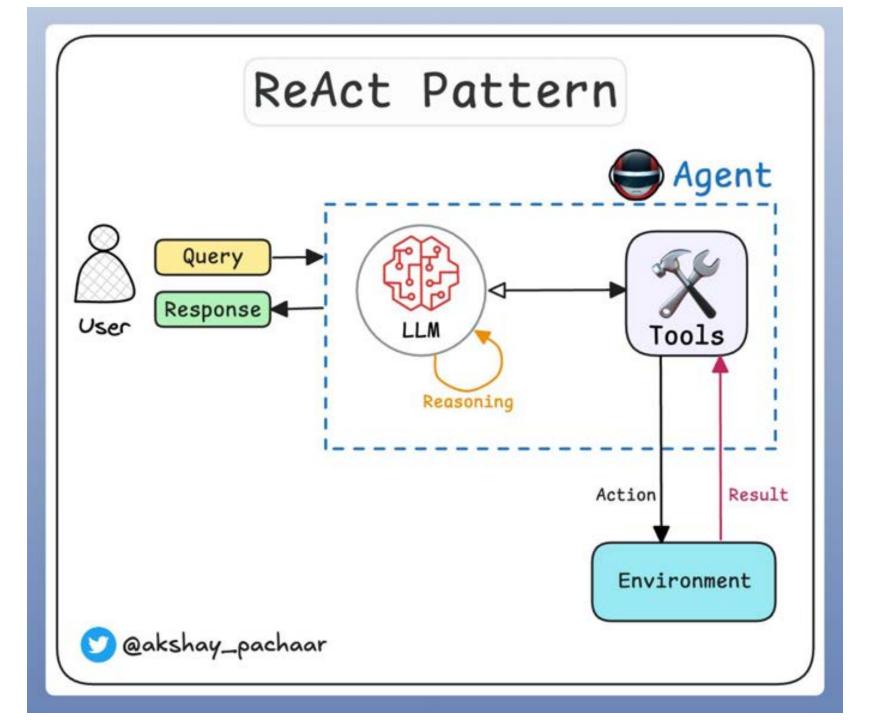


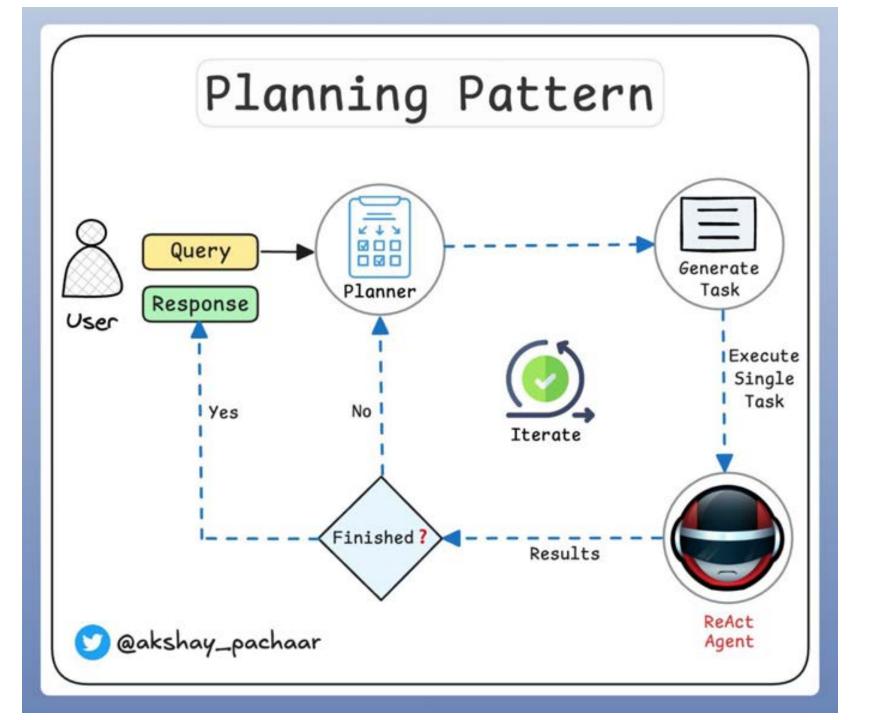




Tool Use Pattern







Multi-agent Pattern Product Manager Agent 1 Query Response User Agent 2 Agent 4 Tech Delegation Dev0ps Lead Expert Agent 3 💟 @akshay_pachaar Software Developer

Establishing Governance in AI Organizations

Implementing AI Governance and Compliance Strategies

Al Policy & Ethical Accountability

Establishing a comprehensive AI policy ensures that there is clear accountability for AI-driven decisions. Organizations must define roles and responsibilities to mitigate risks associated with AI applications, promoting ethical usage and decision-making processes.

Regulatory Compliance Frameworks

Organizations must adhere to various regulatory frameworks such as GDPR, the EU AI Act, and sector-specific regulations to ensure compliance. This is crucial for safeguarding data privacy and maintaining public trust while leveraging AI technologies.

Explainability in AI Systems

Ensuring that AI agents operate within transparent and auditable frameworks is essential for explainability. This means that the processes and outcomes of AI systems must be clear, allowing stakeholders to understand how decisions are made and to ensure accountability.

Bias Control Mechanisms

Implementing robust strategies for bias mitigation is critical in AI applications. Organizations need to develop frameworks that not only identify but also control biases in AI-driven processes, ensuring fairness and equity in outcomes.

Example of AI in Recruitment

An illustrative example is the use of AI-powered recruitment agents analyzing job applications. These systems must ensure fairness by implementing bias mitigation strategies to provide equal opportunities for all candidates, reflecting the organization's commitment to diversity and inclusion.

Al Agent Training and Deployment Strategies

Effective Strategies for AI Agent Implementation

AI Agent Training and Deployment

In this pivotal step, we focus on the comprehensive training and deployment of AI agents. This involves curating a robust data strategy that incorporates both structured and unstructured enterprise data, which is essential for enhancing the agents' learning capabilities and ensuring their effectiveness in real-world applications.

Data Strategy

A well-defined data strategy is crucial for the success of AI agents. It entails feeding agents with a mix of structured data, such as databases and spreadsheets, and unstructured data, like emails and social media content. This diverse data input allows agents to learn from various contexts and perform more effectively in different scenarios.

Learning Paradigm

Implementing Reinforcement Learning from Human Feedback (RLHF) is a cutting-edge approach that enables AI agents to refine their decision-making processes based on real-time feedback from human users. This paradigm not only enhances the learning experience but also ensures that the agents align more closely with human expectations and needs.

Multi-Agent Collaboration

Facilitating collaboration among AI agents through swarm intelligence models is a game changer. This strategy allows multiple agents to work together efficiently, pooling their insights and capabilities to solve complex problems, optimize processes, and improve overall performance.

Example in Telecommunications

A prime example of this approach can be seen in the telecommunications sector, where AI-driven network optimization agents dynamically reallocate bandwidth. These agents analyze real-time data and make adjustments as needed, ensuring optimal network performance and user experience.

Change Management & Workforce Integration

Integrating AI into Workforce Dynamics

Upskilling Programs

Implementing comprehensive upskilling programs is essential for preparing employees to effectively work alongside AI agents. These training sessions should focus on enhancing technical skills, understanding AI functionalities, and fostering collaboration between human and AI team members to improve overall productivity.

AI-Augmented Workflows

Redesigning operational processes to integrate AI into workflows is crucial. This involves creating AI-augmented workflows that enhance human capabilities and ensure that AI agents support human decision-making rather than replace it, fostering a collaborative working environment.

Employee Resistance & Buy-in

Addressing employee resistance to AI adoption requires a strategic approach. Offering transparency about AI's role, involving employees in pilot programs, and actively seeking their feedback can help in overcoming cultural barriers and building trust in technology.

Practical Example in Banking

A practical example can be seen in the banking sector where AI fraud detection agents collaborate with human analysts. This synergy enhances security protocols and reduces response times to potential fraud, showcasing the benefits of integrating AI into traditional workflows.

KPI Dashboarding

Monitoring the effectiveness of AI agents is crucial for success. Real-time KPI dashboarding allows organizations to visualize performance, track efficiency, and respond promptly to operational challenges. This ensures that agents meet operational goals while optimizing resource allocation.

Al Audit & Governance Loops

Implementing AI audit and governance loops is essential for maintaining compliance with established AI ethics and legal frameworks. Regular audits help identify potential biases or legal pitfalls, ensuring that AI systems operate within ethical boundaries and adhere to regulations, thereby fostering trust and accountability.

Iterative Al Model Refinement

Continuous improvement of AI models through iterative refinement is vital for adapting to changing environments. By creating feedback loops, organizations enable agents to learn from past performances, adjust strategies, and enhance effectiveness. This iterative process drives innovation and ensures agents remain competitive.

Performance Metrics & Continuous Learning

Strategies for Effective AI Model Oversight

Transforming Enterprises with Autonomous Al

Embracing AI for Future-Ready Enterprises

The future enterprise is agentic

As we look towards the future, organizations will be increasingly defined by autonomous AI agents that will reshape business operations, workforce dynamics, and decision-making processes. This transformation is not just a trend; it represents a fundamental shift in how enterprises will function, leveraging AI to enhance efficiency and adaptability in a rapidly changing business landscape.

CIOs must lead the AI transition

Chief Information Officers (CIOs) play a critical role in guiding their organizations through the transition to an AI-driven landscape. Their leadership is essential for ensuring that AI strategies are aligned with governance frameworks and technology initiatives, which are vital for successful integration of AI. This responsibility highlights the need for CIOs to be at the forefront of this transformative journey.

The time to act is now

Organizations that aspire to become agentic must initiate steps today towards building a robust AI framework. This involves launching pilot projects that can be scaled effectively across the organization. By taking decisive action now, companies can lay the groundwork for a future where AI not only supports but also drives business innovation and operational excellence.

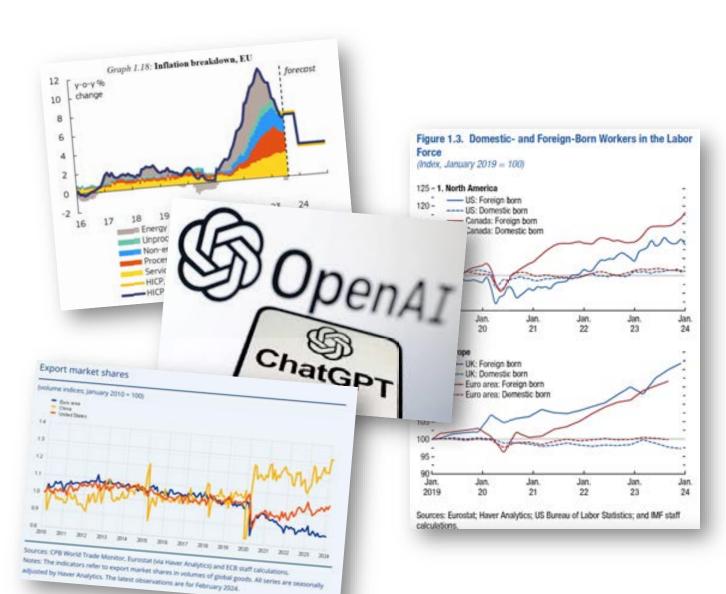
Business Strategy

The Future of Business: Embracing Agentic Organizations

Agentic organizations will shape the business landscape in the next decade. Early adopters will not only thrive but also lead the market transformation, setting new standards for success and innovation.

THE GEOPOLITICAL, MACROECONOMIC, AND TECHNOLOGICAL DRIVERS OF CHANGE

- A post-global world
- 2. A post-green world
- 3. A post-digital world
- 4. Challenges and opportunities for CIOs



FROM «QUAESITUM» TO «PETITUM»



The Evolution of Al in Industrial Applications

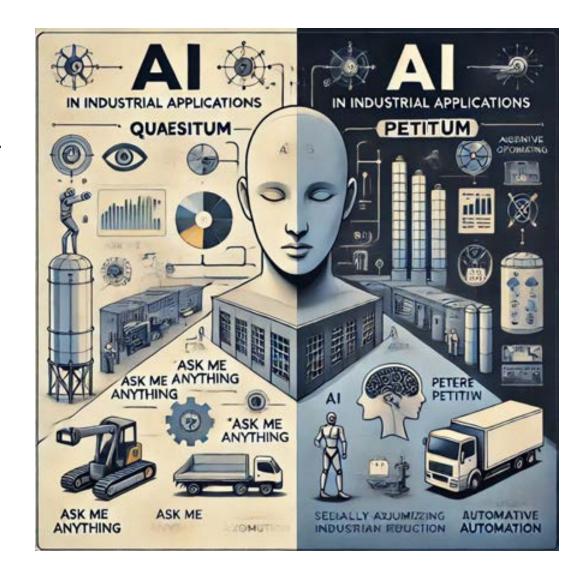
In classical Latin, **QUAERERE** means to seek, to ask, while **PETERE** means to pursue, to execute, to act upon a request. This distinction perfectly maps onto the evolution of **Al in industrial business**, particularly in **industrial refrigeration**, where companies are shifting from **information-based Al (Quesitum)** to **agentic Al (Petitum)**.

From «AI QUAESITUM» to «AI PETITUM»

Today's AI tells us:

"Ask Me Anything."

But the **business impact** of Al depends on whether it simply answers your question (Quesitum) or **executes tasks autonomously** (Petitum).



SDA Bocconi school of Management

QUAERERE / QUESITUM: THE AI THAT INFORMS

"I'll give you an answer."

This is the logic of search engines, chatbots, and digital assistants, providing recommendations, reports, and insights.

Example in Industrial Refrigeration:

A plant manager asks an Al assistant:

"What is the optimal temperature setting to reduce energy consumption?"

The AI provides a detailed answer based on historical data and energy efficiency guidelines, but the manager still needs to apply the insights manually.

This is a **Quesitum Al**—valuable but **passive**, requiring human intervention to execute actions.



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PETERE / PETITUM: THE AI THAT ACTS

"I'll do it for you."

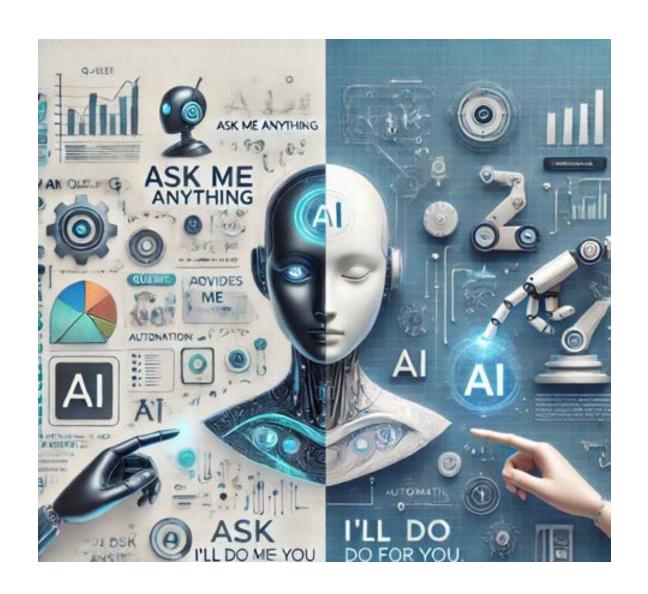
This is the logic of **agentic Al platforms** that don't just suggest—they **automate**, **optimize**, **and execute operations dynamically**.

Example in Industrial Refrigeration:

The plant manager instructs an AI agent: "Optimize the cooling cycle to minimize energy costs while maintaining product safety."

The AI analyzes real-time conditions, adjusts compressor load dynamically, and optimizes temperature settings—all without human intervention.

This is **Petitum Al**—an **agentic system that takes responsibility** for the outcome, transforming **passive knowledge into autonomous execution**.



FROM QUAERERE TO PETERE IN INDUSTRIAL BUSINESSES

Why PETERE / PETITUM AI is the Future of Industrial Refrigeration

- **Energy Efficiency:** All agents can dynamically adjust refrigeration settings 24/7, optimizing for peak efficiency while reducing operational costs.
- Predictive Maintenance: Instead of just reporting a potential equipment failure, an AI agent can preemptively schedule maintenance, reducing downtime.
- Supply Chain Integration: All agents don't just suggest ordering more refrigerant—they place the order automatically based on real-time inventory tracking.

Conclusion:

Industrial refrigeration businesses that move from QUAERERE (asking for insights) to PETERE (delegating intelligent execution) will unlock higher efficiency, lower costs, and real-time adaptability in a highly competitive and energy-intensive industry.



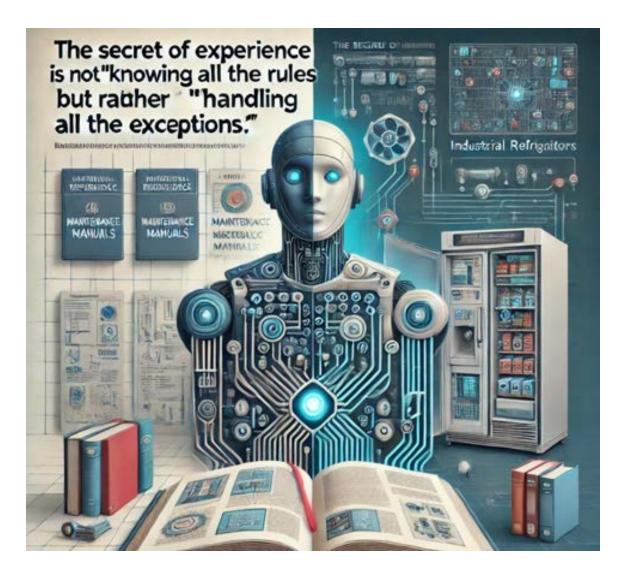


THE AGENTIC EVOLUTION IN INDUSTRIAL AI



Al Type	Quesitum AI (Informative)	Petitum Al (Agentic)
Action Mode	Provides answers	Executes decisions & tasks
Human Effort	High (user must act on info)	Low (Al optimizes & acts)
Example in Industrial Applications	Suggests the best temperature range for efficiency	Actively adjusts temperature settings for real-time optimization
Impact on Business	Supports decision-making	Automates processes for efficiency & cost savings

THE SECRET OF EXPERIENCE



 Is not «Knowing All the Rules»

 But rather «Handling All the Exceptions»

CONCLUSIONS

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GRANDI PIATTAFORME INDUSTRIALI EUROPEE

Il concetto di "piattaforme industriali europee"

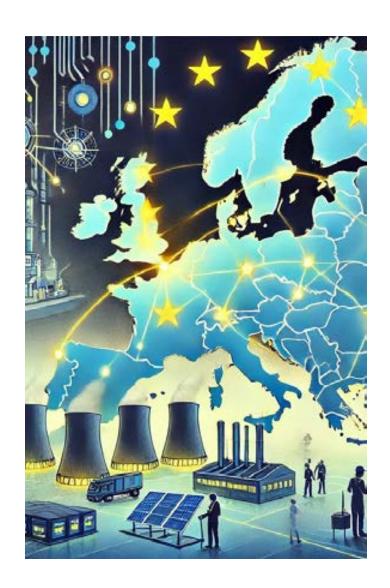
- Strumenti di cooperazione su larga scala, finalizzati a colmare ritardi industriali e tecnologici dell'Europa.
- Necessità di investimenti condivisi e di economie di scala che i singoli Stati membri, agendo da soli, non potrebbero sostenere.

Settori prioritari

- Energia: sviluppo di tecnologie nucleari sicure, fonti rinnovabili avanzate, reti smart grid, idrogeno verde.
- Difesa e satelliti: costruzione di un'industria comune europea in grado di competere con le potenze globali.
- Telecomunicazioni, cloud e Intelligenza Artificiale: realizzazione di infrastrutture europee autonome per la gestione dei dati e lo sviluppo di IA, riducendo la dipendenza da player extra-UE.
- Automotive, acciaio, metalli: rilancio di filiere strategiche per la transizione ecologica (veicoli elettrici, metallurgia "verde").
- Logistica e smart city: tecnologie per la mobilità sostenibile, la gestione integrata del traffico, la digitalizzazione dei servizi urbani.

Modalità di realizzazione

- Fondi europei mirati (es. PNRR, fondi BEI) gestiti da consorzi multinazionali.
- Condivisione dei rischi tra pubblico e privato, incentivando la collaborazione tra università, centri di ricerca, PMI e grandi gruppi industriali.
- Normative semplificate a livello UE, in grado di favorire la creazione di "campioni europei" e di spingere la ricerca su tecnologie emergenti.



PIATTAFORME EUROPEE: TRE CASI DI **SUCCESSO**









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SECONDA RACCOMANDAZIONE

IL 28° REGIME DIGITALE E LA CREAZIONE DI UN MERCATO UNICO DEI CAPITALI FOCALIZZATO SU EARLY STAGE, VENTURE CAPITAL E PRIVATE EQUITY

1. Perché è essenziale

- Oggi l'Europa soffre di frammentazione nei mercati finanziari, ostacolando la crescita di startup innovative e impedendo la nascita di nuove multinazionali.
- La concorrenza con USA e Cina impone la creazione di un ambiente favorevole all'innovazione, che premi il rischio e valorizzi le idee.

2. Elementi chiave

- Unificazione delle regole: standard comuni per la regolamentazione di fondi VC e PE, agevolazioni fiscali omogenee, procedure snelle.
- Centralizzazione o armonizzazione degli "hub finanziari" europei: coinvolgimento delle principali piazze (Francoforte, Milano, Parigi, Amsterdam) in un ecosistema integrato.
- Fondo Europeo per l'Innovazione: sostegno diretto alle startup early stage che operano in settori ad alto impatto (IA, biotech, green tech, cybersecurity, ecc.), in sinergia con le piattaforme industriali comuni.

3. Principi del 28esimo regime

 Visione del Rapporto Letta: Creare un contesto giuridico "nativo digitale" a livello UE, parallelo ma non sostitutivo delle normative nazionali, in cui le imprese possano scegliere di operare senza doversi adeguare a 27 legislazioni diverse.

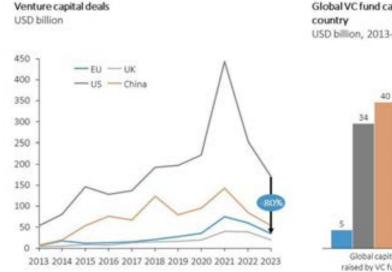


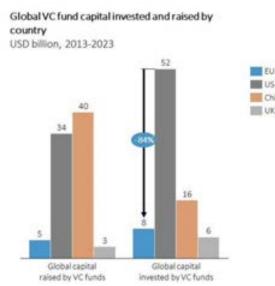


Alla crescita delle startup dedichiamo briciole. E poi ci perdiamo nel bosco, come Pollicino

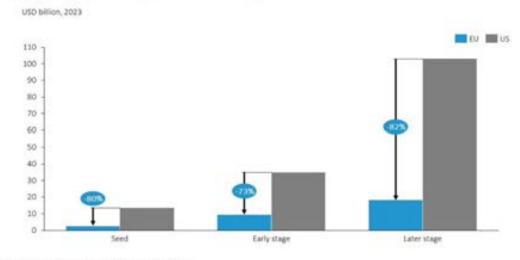
Un'Europa che ha paura di rischiare, che guarda all'ombelico dei propri interessi nazionali, frammentati e inadeguati alle sfide globali. Un'Europa che dedica alle pensioni una spesa superiore per ordini di grandezza a quella per gli investimenti in venture capital e startup.

Venture capital investment





Venture capital investment by development stage



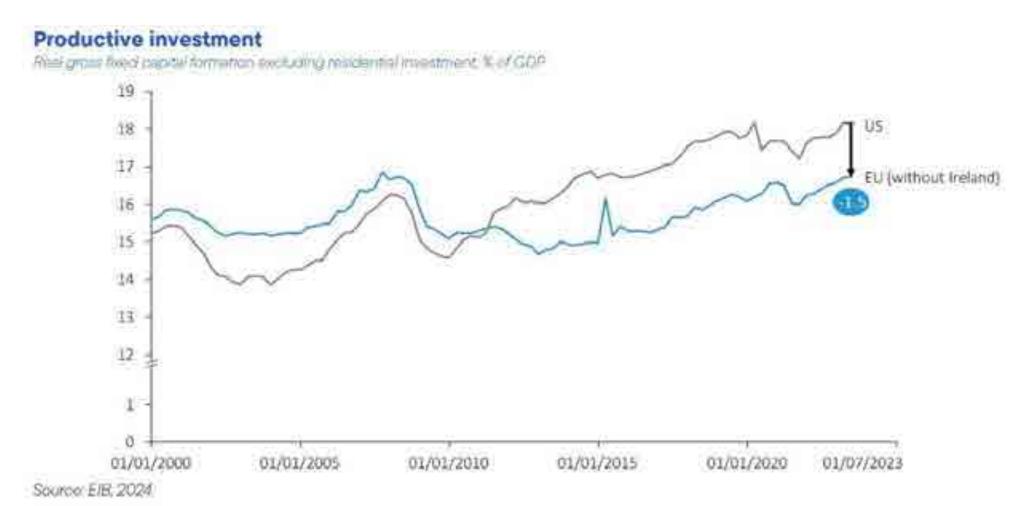
Source: PitchBook data: Accessed 20 November 2023.

Source: EIB.



Mettiamo tanti soldi nel mattone, pochi nelle tecnologie

Mentre fino al 2010 l'Europa investiva più degli USA, nell'ultimo decennio abbiamo accumulato un gap di investimenti produttivi (al netto di quelli immobiliari residenziali) che si manifesta soprattutto nei settori già avanzati (digitale, difesa e sicurezza, energia, pharma, aerospazio).

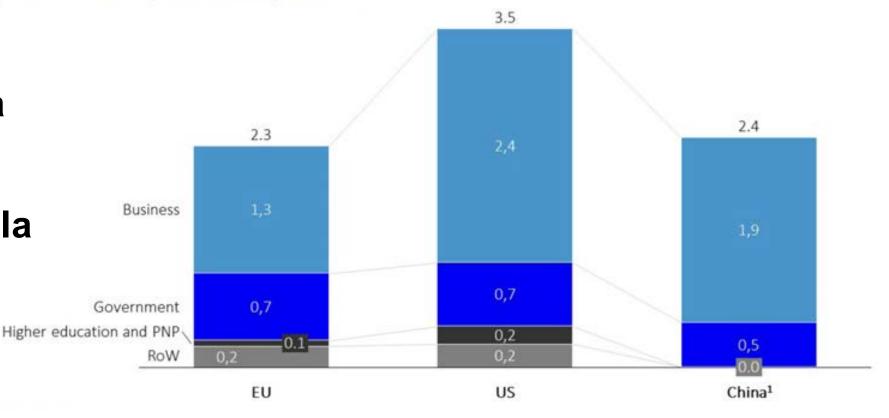




R&D intensity

R&D intensity, GERD as % of GDP, by source of funding, 2021

R&D: rispetto alle aziende UE, la quota di investimenti delle aziende cinesi è del 50% superiore. Quella americana è quasi il doppio.



1 Except Hong Kong.

Note: PNP refers to private non-profit sector, RoW refers to rest of the world.

Source: European Commission, 2024. Based on Eurostat and OECD.



Un piano Marshall da 800 miliardi. All'anno, per 5 anni

Servirebbero 450 mld/anno per la transizione energetica, 150 mld/anno sulle tecnologie digitali, 50 mld/anno su difesa e sicurezza, 100-150 mld/anno per produttività e innovazione. Il tutto per almeno 5 anni, e da un bilancio federale, non frammentato per 27 paesi

Annual additional investment needs (2025-2030)

In EUR billion

Investment category				2025-2030
Achieving transition	the	energy	Energy (including the deployment of clean technologies)	300
			Transport (including charging infrastructure)	150
			Total	450
Becoming a leader in digital technologies				150
Strengthening defence and security capabilities				50
Boosting productivity through breakthrough innovation				100;150
Total annual additional investment needs				750;800
ECB estimate				771

TERZA RACCOMANDAZIONE



RIVOLUZIONE NELLA GOVERNANCE DELLE AZIENDE E NELL'ISTRUZIONE EUROPEA

Governance: Quote "blu" e quote giovani

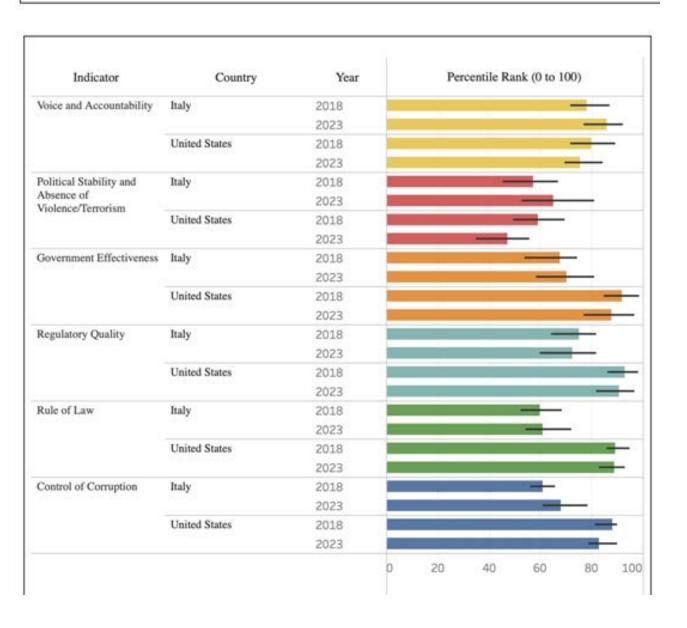
- Quote "blu": obbligo di includere nei consigli di amministrazione membri provenienti da diversi Paesi dell'Unione, con l'obiettivo di promuovere competenze e visioni internazionali.
- Quote giovani: riserva di posti in governance per under 35, favorendo il ricambio generazionale, la capacità di innovare e di comprendere meglio le trasformazioni digitali.

Istruzione Europea:

- 1. Un'istituzione formativa europea che offra un servizio di formazione obbligatoria per i giovani cittadini europei.
- 2. L'estensione (o rimodulazione) dell'obbligo scolastico di unodue anni, oppure l'istituzione di un percorso formativo sostitutivo degli ultimi anni di istruzione secondaria superiore
- 3. L'istituzione della figura di un Commissario Europeo all'Istruzione e Formazione Permanente, che definisca programmi allineati alle priorità strategiche
- 4. Corsi obbligatori di formazione per i membri dei Consigli di Amministrazione (CdA) delle società di capitali, in modo da garantire competenze adeguate alle sfide future.



Worldwide Governance Indicators



Gli indicatori di governance della world bank evidenziano i ritardi italiani su:

- efficacia di governo e pubblica amministrazione
- qualità della regolamentazione
- rispetto dello Stato di Diritto
- controllo della corruzione



THANKS!

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