OPPORTUNITIES AND THREATS IN THE USE OF AI IN BUSINESS SYSTEMS

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ABSTRACT: *The proliferation of Artificial Intelligence (AI) within business systems constitutes a pivotal dimension of contemporary digital transformation, offering both unprecedented opportunities and systemic risks. From a strategic perspective, AI enhances organizational capabilities by enabling predictive analytics, data-driven decision-making, and process automation, thereby facilitating efficiency gains, innovation, and competitive differentiation. The adaptation of AI to business contexts, however, is not merely a technological exercise but a structured, multi-stage process involving discovery, definition, design, development, and delivery, each of which requires alignment between technical infrastructures and organizational objectives. While AI applications generate measurable value across diverse functions - including supply chain optimization, marketing intelligence, and customer experience management - adoption also foregrounds complex challenges. These include ethical and regulatory concerns surrounding algorithmic bias and data governance, the socio-economic implications of workforce displacement, and the epistemological limitations of machine-driven decision-making absent human intuition. Furthermore, the intensification of AI deployment increases exposure to cybersecurity vulnerabilities and amplifies governance demands. The long-term sustainability of AI-driven transformation therefore hinges on integrative frameworks that combine technical rigor, managerial oversight, and institutional safeguards. A balanced, ethically grounded approach to AI adoption will determine whether such systems reinforce inclusive innovation or exacerbate structural inequalities in the digital economy.*

KEY WORDS: *AI, digitalization, risk.*

JEL CLASSIFICATION: *M15, O33, L86.*

1. INTRODUCTION

Using only historical precedent, basic analytics, and intuition to make judgements and take action is no longer effective, nor is it effective to pursue short-term objectives or commoditised technologies. Still, far too many companies are stuck in the

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same old way. Successful people increasingly use analytics to their advantage; that is, they draw insights, patterns, and trends from data to inform their decisions, actions, and results. This covers both the complimentary fields of traditional and advanced analytics.

A fundamental business advantage is data, but only if there is understanding of its usage and all businesses, regardless of their primary products, should start to consider themselves data and analytics firms. As long as information is involved, this is an essential step in gaining an advantage over competitors and a greater capacity to generate enormous benefits for both individuals and businesses.

A growing number of businesses are aware of this and wish to transform their data and analytics, but they find it difficult to develop a strategic plan and vision around practical AI potential, use cases, and applications.

Words like disruption, innovation, and change are frequently used, and typically in a broad sense. In a similar way, the term "digital transformation" is equally ambiguous due to its broad definition. Businesses have to decide which particular technology or technology systems such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) to use first. They also have to decide how to set priorities for various digital activities and goals. To some extent digital transformation can help businesses achieve their objectives. Companies should calculate what is the possible return on investment and what amount will it cost. Another aspect is the return on investment that can be generated.

In the term "applied AI transformation" each of the three words has a distinct and intended meaning. Many people consider artificial intelligence (AI) to be primarily theoretical because of its relative infancy and the limited number of real-world applications it has seen this far. Applying AI to real world use cases for which we are already witnessing a substantial and varied proliferation is meant to be distinguished from theoretical AI.

The phrase "transformation" as it should be understood, refers to using AI to deliver high impact results considerably more quickly and affordably, or to produce particular benefits or outcomes that are not possible with other means. There is no space for doubt in this situation; applied AI transformation refers to the use of both established and new AI methods to create practical solutions that have the potential to change both organisations and people's lives.

2. THE ADAPTATION OF AI SYSTEMS TO BUSINESS NEEDS

The adaptation of AI systems to business needs requires a structured, multi-stage approach encompassing discovery, definition, design, development, and delivery. During the discovery phase, organizations identify critical business challenges, operational pain points, and potential opportunities for AI integration, establishing a foundation for strategic alignment. The definition stage translates these insights into precise objectives, use cases, and success metrics, providing clarity on both organizational goals and stakeholder expectations. In the design phase, technical architectures, user experiences, and data workflows are developed, ensuring that the solution is both functional and aligned with human-centred requirements.

Development involves the implementation of algorithms, software, and hardware components, supported by iterative testing, validation, and adherence to best practices in engineering. Finally, the delivery stage operationalizes the AI system within the real-world business context, integrating monitoring, continuous improvement, and scalability strategies to maximize efficacy, usability, and long-term value creation.

The successful adoption of artificial intelligence (AI) in business contexts requires the prior identification of organizational needs, objectives, and pain points, thereby ensuring that technological interventions are strategically aligned with measurable priorities.

Beyond operational efficiency, AI solutions are increasingly evaluated according to their dual capacity to enhance corporate performance and human experiences, thereby reinforcing both economic and social value creation. This dual orientation necessarily encompasses a diverse set of stakeholders that include customers, employees, partners, and investors, each of whom derives distinct benefits from implementation.

The following table shows a comparison between the EU states and USA, providing data for three key indicators.

Table 1. Adoption of AI in business in the EU and USA

Indicator	EU	USA
Adoption rate by business size	• 13.5% of enterprises with ≥10 employees use AI (2024) • 42% of large enterprises (≥250 employees) use AI (2024)	• 3.8% of all nonfarm businesses use AI to produce goods/services (2023) • 55-60% of small businesses report AI use (2025 surveys)
Adoption rate by sector	Information & Communication: 48.72%, Professional, Scientific & Technical Activities: 30.53%, Real Estate Activities: 15.45%, Housing / Construction: 6.09%	Information sector: 18.1% adoption vs 5.4% overall
AI usage by technology/ Application	• Text mining: 6.9% • Natural language generation: 5.4% • Speech recognition: 4.8%	• Generative AI: 58% of small businesses report usage (2025)

Source: Eurostat, openstats.eu, euronews.com, census.gov, gurufocus.com, usnews.com, uschamber.com

The EU shows lower adoption in SMEs but higher among large enterprises.

The USA shows widespread uptake among small businesses, especially in generative AI.

Sector and technology use differ, with the EU adopting core AI tools incrementally, while US SMEs leap directly into generative AI.

AI applications demonstrate versatility across both commercial and personal domains. In organizational settings, they support activities such as supply chain optimization, marketing strategy, and customer support. At the individual level, they

enable personalized experiences, improved productivity, and enhanced decision-making processes. Competitive differentiation is achieved not only through unique technological features but also through rigorous market analysis that evaluates adoption trends, potential demand, and systemic barriers.

Demonstrating effectiveness remains central to establishing credibility. Evidence-based methods, including pilot studies, case analyses, and quantitative performance evaluations, confirm the capacity of AI solutions to generate tangible outcomes for both businesses and individuals. Moreover, long-term adoption is contingent upon the usability, practicality, and overall engagement of the solution, underscoring the importance of human-cantered design principles. Finally, clarifying the developmental scope, whether as a prototype, proof of concept, minimum viable product, or complete solution, provides stakeholders with a framework for assessing scalability, resource requirements, and future innovation pathways.
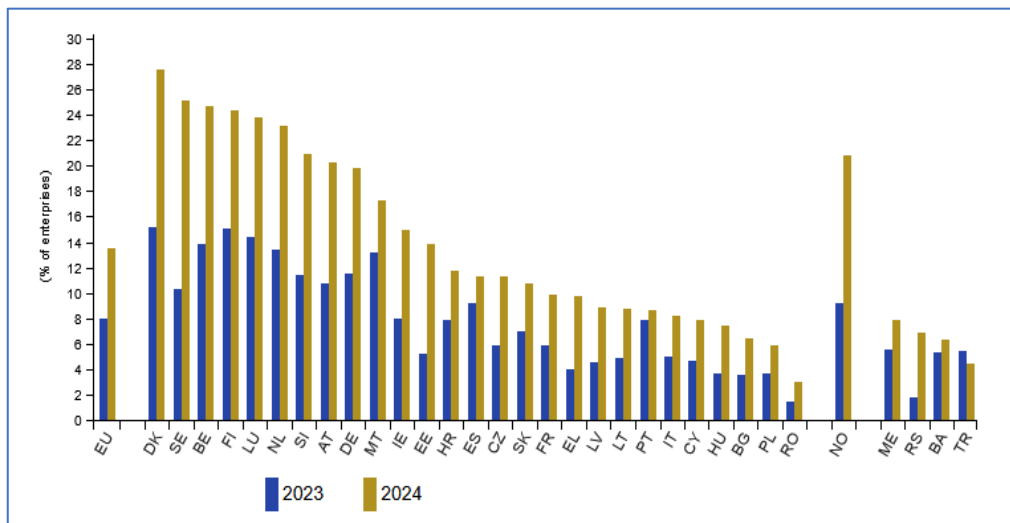
3. DEVELOPMENT OF AN AI SOLUTION

The development of AI-driven business solutions depends on a structured approach to data and infrastructure. Key considerations include identifying whether relevant datasets already exist or must be generated through means such as IoT or data augmentation, as well as leveraging external public or commercial sources when appropriate. Governance is essential, with clear accountability for data ownership, access procedures, and compliance requirements. Technical implementation requires robust data pipelines for ingestion, ETL, processing, and storage, alongside rigorous preparation processes such as cleaning, validation, transformation, and labelling.

Cloud platforms like Google Cloud Platform (GCP) and Amazon Web Services (AWS) enable model training, optimization, and validation, while programming languages, architectures, and technologies, including edge and fog computing and IoT firmware that form the broader tech stack. Hardware considerations, including manufacturing and material specifications, must be aligned with both functional and non-functional requirements. By combining agile practices for software with structured, waterfall-like methodologies for hardware, organizations can balance flexibility with precision, ensuring scalability and reliability in solution design.

The creation of AI solutions requires integrated hardware and software design, addressing both physical construction and digital interfaces. Hardware considerations include structural components and materials, while software focuses on user interfaces, system architecture, and application logic.

Complementing these are elements that shape the user experience, such as information architecture, interaction flows, user journeys, and defined use cases. Technical schematics, charts, diagrams, and visual representations support the design process by facilitating communication, guiding development, and ensuring alignment between functional requirements and user needs.

The following Figure shows the evolution of businesses using AI in just one year:

Source: Eurostat

Figure 1. Enterprises using AI technologies in the EU

Compared with 2023, the use of AI technologies in the EU increased by 5.45.

In order to promote AI-driven innovations there must be a clear articulation of underlying theories and the selection of appropriate investigative tools, including software, algorithms, and analytical techniques. These components guide the systematic exploration, testing, and validation of concepts, ensuring that the invention maintains scientific rigor. Translating specifications and conceptual designs into a high-quality, functional product requires structured development processes, adherence to best practices in both hardware and software engineering, and rigorous documentation of all stages.

Agile methodologies, such as Scrum, Kanban, or Lean, provide frameworks for iterative software development, while continuous integration and continuous delivery (CI/CD) practices ensure reliable, repeatable deployments. Version control systems, including branching strategies with tools like Git, support collaborative development and maintain code integrity. Comprehensive testing protocols, encompassing functional verification, quality assurance, and usability evaluation, are essential for optimizing performance and user experience. Finally, the definition of clear success metrics, tracking mechanisms, and user experience assessments ensures that the solution's impact can be measured, monitored, and continuously improved throughout its lifecycle.

The implementation of AI solutions in real-world settings requires strategies that ensure accessibility, usability, and measurable impact for intended beneficiaries. Continuous monitoring of the solution's operational state is essential to promptly identify and address issues, maintaining reliability and performance.

Over time, data-driven adjustments allow the system to adapt and improve through the integration of new information, fostering ongoing learning and refinement. Ensuring efficacy involves verifying that both users and the organization derive the anticipated benefits from the solution, while also mitigating risks such as model drift or

other performance degradations. Furthermore, attention to non-functional requirements including scalability, security, and maintainability is critical to sustaining effectiveness as the solution expands and evolves in response to operational demands.

4. OPPORTUNITIES AND THREATS

Artificial intelligence (AI) is a powerful tool for decision-making and problem-solving, though few individuals fully understand its capabilities and practical applications. Leaders and professionals with both AI expertise and business acumen play a crucial role in guiding organizations to leverage these technologies effectively.

Machine learning, AI, and data science can be complex and overwhelming due to the diversity of methods and use cases. Business leaders benefit from focusing on high-level strategies, while data scientists and engineers determine the specific methods to employ, following an iterative and experimental approach to optimize outcomes.

Bridging the technical and business aspects of AI is a central challenge. The technical complexity of AI and the vast potential for generating value from data require careful alignment of strategies with organizational goals. Most AI approaches are applicable across industries and business processes, as data exists in every organization, function, and department, including marketing, sales, and operations.

Common AI applications can be adapted across contexts. For example, predictive models for customer attrition apply to both retail and insurance, while image recognition techniques used in medical diagnostics can also support security systems. In these cases, methods and objectives are consistent, with differences arising only in data and context.

Successful AI adoption requires collaboration among business leaders, domain specialists, and AI practitioners to identify opportunities, prioritize initiatives, and select effective strategies. AI applications should be tailored to organizational data and goals rather than specific industries. Opportunities must be systematically evaluated and ranked according to their potential business value and return on investment, ensuring meaningful impact across functions and sectors.

Modern employment requires a combination of hard skills, including technical competence, and soft skills. Soft skills are equally crucial, often proving even more important than technical abilities in determining an employee's success. These skills, including problem-solving, critical thinking, flexibility, adaptability, teamwork, and resourcefulness, are difficult to teach and master, and their sustained use is not guaranteed even after training. While technical abilities such as AI and data science are in growing demand, soft skills are increasingly essential across real-world occupations.

A significant skills gap exists, as many students in today's educational system are not developing these capabilities at a substantial level. Most soft skills remain beyond the current and foreseeable capabilities of AI, limiting the technology's ability to automate or replace a wide range of tasks. Consequently, numerous career opportunities exist for individuals with these skills, often facing minimal competition from machines. Large-scale talent shortages, as observed in professions like software engineering and data science, will persist without individuals equipped with the necessary competencies.

Technological progress is irreversible, as demonstrated historically during periods such as the Luddite era. Proactive discussion and planning are essential to ensure that technology and humans coexist in mutually beneficial ways, particularly in the context of widespread job automation. Some perspectives suggest that AI replacement of certain occupations could allow individuals to pursue more meaningful, fulfilling activities rather than working solely to meet societal and financial demands. However, without appropriate infrastructure and protections, such outcomes could be negative. Concepts such as universal basic income (UBI) may help address the absence of human labour requirements and prevent poverty, but widespread implementation remains a future consideration. These factors must remain central as AI and automation continue to develop.

5. CONCLUSIONS

The integration of AI into business systems presents a transformative opportunity for companies to enhance decision-making, optimize operations, and gain a competitive edge. Businesses that successfully leverage AI can harness data-driven insights to improve efficiency, customer experience, and innovation. However, AI adoption also introduces significant challenges, including ethical concerns, job displacement, and the need for continuous adaptation.

To maximize AI's benefits, businesses must strategically align AI implementation with organizational goals, ensuring transparency, regulatory compliance, and workforce reskilling. Moreover, AI's success relies on collaboration between technical experts and business leaders to bridge the gap between AI's capabilities and practical applications.

While AI has the potential to revolutionize industries, it cannot fully replace human intuition, creativity, and critical thinking. The future of AI in business depends on its responsible and ethical use, alongside policies that mitigate risks and ensure sustainable employment. By balancing innovation with governance, businesses can harness AI's full potential while preparing for an increasingly automated world.

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