

# *Unveiling Organizational AI Adoption Patterns in Italian Companies through the Lens of the Diffusion of Innovations Theory*

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This paper investigates the adoption and integration of artificial intelligence (AI) technologies within a sample of 237 Italian enterprises using the Diffusion of Innovations (DOI) theory as the theoretical framework. It examines the characteristics of companies leading in AI adoption, evaluating their alignment with the innovator and early adopter profiles defined by Everett Rogers in 2003 within the DOI framework. The research emphasizes AI's significant role in enhancing operational efficiency, fostering innovation, securing competitive advantage, and driving long-term growth. It also identifies challenges such as lack of skills, data management issues, and ethical concerns. Our findings contribute empirical evidence to the academic literature on the DOI theory, addressing the underexplored context of AI in Italy. The study provides a nuanced perspective on AI's impact on employment and sets a foundation for future research, offering managerial insights for strategically deploying AI.

*Keywords:* artificial intelligence, diffusion of innovations theory, early adopters, implementation challenges, Italian companies

*JEL Classifications:* L20; M10; O33; O52

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## **Introduction**

Emerging technologies, particularly Artificial Intelligence (AI), are significantly influencing organizational structures (Bailey et al. 2022). The

recent widespread availability of Large Language Models (LLMs) has generated curiosity about AI's impact on work. AI technologies drive innovation, efficiency, and competitive advantage by enhancing decision-making, automating routine tasks, and improving customer engagement (Bughin et al. 2017; Agrawal et al. 2019; Davenport and Ronanki 2018). However, successful AI adoption requires careful consideration of ethical implications, workforce reskilling, and robust data governance frameworks (Bostrom and Yudkowsky 2018).

Despite growing global interest in understanding AI adoption across industries (Calvino et al. 2022; Calvino and Fontanelli 2023; IBM Corporation 2022; 2023; Maslej et al. 2023), there is a lack of research on AI adoption in European countries, particularly in Italy. To fill this gap, we adopted the Diffusion of Innovations (DOI) theory (Rogers 2003), providing a theoretical lens to examine AI adoption in Italian companies. This study assesses the alignment of these companies with the innovator and early adopter profiles defined by the DOI framework. We chose this theoretical approach because the DOI theory has been widely used and proven effective in studies investigating AI adoption across various contexts. This is evidenced by its application in numerous recent studies (e.g. Agrawal et al. 2019; Ahituv and Hasgall 2019; Alsheibani et al. 2018; Horani et al. 2023; Lund et al. 2020).

Regarding the Italian context, recent studies have explored the potential impact of AI adoption on Italy's economy and industrial competitiveness. As argued by Saracco (2022), Italy's AI strategy (Programma Strategico Nazionale per l'Intelligenza Artificiale) aims to increase adoption, particularly among small and medium-sized enterprises (SMEs), which form the backbone of the country's industrial landscape (Saracco 2022). AI adoption has been associated with increased productivity, value-added, and higher average wages within adopting firms, although its impact on employment varies by firm size (Bisio et al. 2023). Adopting AI can significantly enhance the competitiveness of firms by improving productivity, customer experience, and problem-solving capabilities (Kinkel et al. 2022). For SMEs, successful AI integration requires addressing four critical dimensions: people, processes, products, and customers (Del Sarto and Piccaluga 2021). Overall, while AI offers significant opportunities for European firms, its effective deployment requires strategic planning and adaptation to maximize benefits while addressing potential challenges, such as eth-

ical considerations and the need for transparent, reliable AI systems (Annoni et al. 2018).

Given the importance of the topic and the identified gap in the existing literature, this study aims to explore AI adoption in Italian organizations, understand predominant AI solutions, measure integration depth, and examine the main implementation challenges.

The research question is: What are the characteristics of Italian companies that are early adopters of AI, and how do these characteristics align with the attributes of innovators and early adopters as defined by the DOI theory?

Our study employed a convenience sampling method, focusing on all the Executive MBA graduates from an Italian Business School. The sample comprises those graduates who voluntarily responded to our web-based survey invitation. This approach allowed us to access a relevant population of business professionals while acknowledging the limitations inherent in convenience sampling (e.g. Alessi and Martin 2010; Schonlau et al. 2009). This approach yielded 237 valid responses for subsequent analysis, revealing multiple perspectives on AI's future in organizational strategy.

Our study reveals a diverse AI adoption landscape in Italy, including both innovators and early adopters, in line with the DOI framework. Increasing AI spending indicates progress along the innovation curve, with early adopters driving mainstream integration. AI is emerging as a critical enabler for Italian companies, driving efficiency, innovation, and competitive advantage. However, challenges such as skills gaps, data management, and ethical concerns require attention.

By understanding the characteristics of leading AI adopters in Italy, this study aims to provide insights that can inform strategies for promoting AI adoption in other contexts. We also offer recommendations for practitioners on effectively using AI to drive business success, gain a competitive edge, and position their organizations as leaders in technological innovation.

The structure of the paper is organized as follows. The second section outlines the theoretical framework and formulates the research question. In the third section, we delineate the employed methodology. After that, in the fourth section, we outline the main results of the study, which are thoroughly discussed in the fifth section, including the implications of the study and subsequent avenues for research. Finally,

the conclusion and limitations of the study are presented in the sixth section.

## **Theoretical Framework**

### THE DIFFUSION OF INNOVATIONS (DOI) THEORY

The DOI theory, proposed by Rogers (2003), posits that adopting new technologies follows a predictable pattern. It identifies five categories of adopters: innovators, early adopters, early majority, late majority, and laggards. Adopter categories are essential in understanding innovation diffusion within social systems. These categories, derived from empirical data, help to compare and understand innovation adoption. While there are exceptions, they represent a spectrum of innovativeness rather than discrete groups, challenging the notion of a significant 'chasm' between early and late adopters. This perspective views innovativeness as a continuous spectrum, highlighting the differences between categories of adopters and providing insights into their adoption behaviours and motivations (Rogers 2003).

Therefore, these categories efficiently classify individuals based on their innovativeness. Each category shares distinct characteristics, reflecting fundamental differences in how people approach new ideas. Innovators are pioneers who eagerly pursue cutting-edge technologies and are not afraid to take risks when experimenting with them. Early adopters, influential in their own right, play a critical role in spreading innovation to a wider audience. The early majority, a significant segment of the population, carefully observes early adopters before deciding to embrace new concepts. In contrast, the late majority consists of sceptics who adopt innovations only after they have been widely validated. Laggards, the final group, are highly resistant to change and typically adopt innovations only when absolutely necessary. Understanding these categories is essential for organizations and innovators who want to successfully introduce new products, services, or ideas to different segments of society.

In our study focused on AI implementation and early adoption within organizations, we specifically examine the innovators and early adopters. Innovators serve as catalysts for innovation, constantly pushing the boundaries of what is possible in their industries with a relentless pursuit of transformative impact. Their willingness to take risks and engage directly with innovation networks fuels the initial stages of technological advancement. Early adopters complement this momentum by strate-

gically evaluating and swiftly integrating new technologies into mainstream practices. Their role as influential adopters not only validates innovations but also accelerates their widespread acceptance and adoption across industries (Dedehayir et al. 2017).

Together, innovators and early adopters drive the rapid diffusion of innovation, propelling industries forward into new realms of possibility and progress. Therefore, understanding the characteristics of innovators and early adopters is essential for promoting widespread innovation adoption.

The DOI theory highlights the crucial role of innovators and early adopters in technology adoption (Dedehayir et al. 2017). These groups are characterized by their innovative mindset, willingness to take risks, and access to resources. Numerous studies on technology adoption emphasize early adopters due to their significant potential in facilitating organizational uptake of technological innovations and accelerating the digital transformation process effectively. Early adopters demonstrate positive attitudes toward technology, readiness to utilize it, and active involvement in its integration (Ahituv and Hasgall 2019). They also play a crucial role in spreading information through word-of-mouth and serve as benchmarks influencing subsequent market acceptance (Bianchi et al. 2017).

Regarding AI adoption, studies reveal that factors such as relative advantage, compatibility, ease of use, observability, and trialability significantly influence adoption intentions (Raman et al. 2024). Organizations transitioning to Complex Adaptive Systems (CAS) may encourage employees to become early adopters, thereby facilitating effective digital transformation (Ahituv and Hasgall 2019). Understanding the characteristics of innovators and early adopters can expedite innovation uptake for firms and assist policymakers in promoting beneficial technologies (Dedehayir et al. 2017).

Therefore, building on this literature, we argue that in the context of AI, innovators and early adopters recognize AI's potential and invest in its implementation. Since the data collection was conducted in October 2023, during a period of experimentation with AI adoption in organizations, we expected AI adopters in Italy to fall into these adoption categories.

#### ARTIFICIAL INTELLIGENCE ASCENDANCE

The development of Artificial Intelligence in business has seen remarkable innovations and occasional setbacks. While the 1956 Dartmouth Workshop marked the birth of AI as a formal discipline (Moor 2006),

its development soon suffered from early limitations. The resurgence in the 1990s and 2000s was driven by the internet and advances in machine learning and big data, pushing AI into areas such as customer relationship management and business analytics (Zhang and Lu 2021). More recently, AI has experienced rapid growth and today is a transformative force reshaping business strategies and operations across multiple sectors (Gozalo-Brizuela and Garrido-Merchan 2023).

Thus, AI has become one of the most critical technological priorities for companies in recent years, mainly due to the availability of big data and the emergence of sophisticated techniques and infrastructures (Mikalef and Gupta 2021). AI-enabled chatbots and conversational agents, such as ChatGPT, are gaining wide acceptance across various industries to enhance stakeholder relations, engagement, and well-being (Manyika et al. 2017). However, the utilization of AI to enhance business processes was at first predominantly limited to large corporations. These organizations had the necessary big data to train machine learning applications and the financial resources to hire data science experts to develop these applications, along with the requisite technical infrastructure. However, this landscape underwent a significant transformation with the release of OpenAI's ChatGPT in November 2022. As the first widely accessible chatbot powered by a pre-trained neural network, ChatGPT democratized the use of generative AI, offering its capabilities—and inherent limitations—to potentially billions of users (Noy and Zhang 2023).

Owing to the rapid proliferation of AI utilization in both private and public sector entities, the topic of AI has achieved exponential interest among scholars and practitioners. The transformative impact of AI on organizational structures, processes, and employee dynamics has highlighted the growing academic interest in artificial intelligence in organizational studies and the workplace. Recent studies highlight the growing interest in understanding how industries are adopting AI. In the past year, significant research has focused on the impact of AI in various sectors, including manufacturing (Su et al. 2024), banking services (Fares et al. 2023), public sector organizations (Mergel et al. 2023), healthcare (Khan et al. 2023), and pharmaceuticals (Jarab et al. 2023), among others.

This interest spans multiple disciplines investigating how AI is reshaping the paradigm of decision-making, changing the efficiency of operations, and redefining skill requirements and job roles (Davenport and Ronanki 2018; Agrawal et al. 2019; Brynjolfsson and McAfee 2014). However, integrating AI in the workplace requires a comprehensive multi-

disciplinary approach that comprehensively addresses ethical, legal, and technical considerations. This approach effectively balances the potential benefits and mitigates the associated risks of implementing AI (Wachter et al. 2017).

Despite a wealth of research on the adoption of AI in different industries, our review of the literature reveals a significant gap: there seems to be a lack of studies that specifically investigate the understanding and integration of AI in the Italian context, which is characterized by its specificities, such as the fact that SMEs are the backbone of the Italian economy and there is a massive presence of family businesses. This omission highlights the importance of our study, which aims to fill this critical gap by investigating how AI is perceived and implemented in Italy.

### **Methodology**

A web-based survey was implemented in October 2023, targeting Executive MBA graduates from an Italian business school.

For convenience reasons, the sampling population was represented by all the Executive MBA graduates of the Italian business school who received their degrees by 2023. A total of 2,160 graduates received a link to a web-based questionnaire via email. Out of these, 237 questionnaires were fully or partially filled, resulting in a gross response rate of 11%.

Web-based surveys offer fast, cost-effective data collection, reducing errors associated with physical materials and manual entry (Alessi and Martin 2010). Using Computer Assisted Self-Interviewing (CASI), participants completed the survey via email, providing qualitative and quantitative insights into AI applications and their strategic value across organizations.

Given the rapid evolution and widespread adoption of AI technologies among organizations, we chose to use a convenience sample to quickly gather a sufficient number of responses. The sample consists of graduates who voluntarily responded to our web-based survey invitation. This approach enabled us to reach a significant population of business professionals.

Convenience sampling, a non-probability sampling approach, is widely used in research but has significant limitations (Alessi and Martin 2010; Schonlau et al. 2009). While it allows for larger sample sizes compared to single-subject approaches, it falls between such methods and randomized control group studies. Its primary limitation is the potential lack of generalizability due to sample bias (Emerson 2021). Although,

as in this study, the larger sample size of convenience sampling permits some degree of generalization beyond single-subject studies, the absence of random selection fundamentally limits the applicability of results to the broader population (Emerson 2021). Therefore, it is crucial to carefully consider and acknowledge these constraints when interpreting and presenting the findings of this study.

The questionnaire was organized into sections on demographic specifics, the current deployment of AI within respondents' companies, the perceived advantages and challenges associated with AI, and the degree of its integration into business operations (see the Appendix).

Based on the DOI theory, we expected that as the first adopters of AI in Italy (the data were collected in October 2023), they would be classified as innovators or early adopters, as described in Rogers' (2003) seminal article. Therefore, the data collected from the survey were meticulously cleaned and prepared for analysis to address the study's research question: identifying the characteristics of Italian companies that are early adopters of AI and how these characteristics align with the attributes of innovators and early adopters as defined by the DOI theory.

To highlight key findings from our exploratory study, we used distribution frequencies to analyse key aspects identified from survey questions and existing literature. These aspects included, for example, companies' experience with AI technology, motivations driving AI adoption, financial investments in AI in the past and next 12 months, and challenges related to generative AI and its business impact. Through this analysis, we gained valuable insights into the current state of AI adoption and implementation within the Italian companies surveyed.

To address the second part of our research question – alignment with innovators and early adopters as defined by the DOI theory – we conducted a thematic analysis of distribution frequencies derived from our data. This qualitative assessment compared company characteristics identified in our study with the primary traits of innovators and early adopters outlined by Rogers (2003).

The geographical distribution of the 237 valid responses demonstrates nationwide coverage. The organizations surveyed represented a diverse range of sizes, from very small to very large. The majority were small to medium-sized enterprises (SMEs), as evidenced by the median number of employees being 80 – a value more robust than the mean, given the skew of the distribution towards the lower end of the size spectrum.



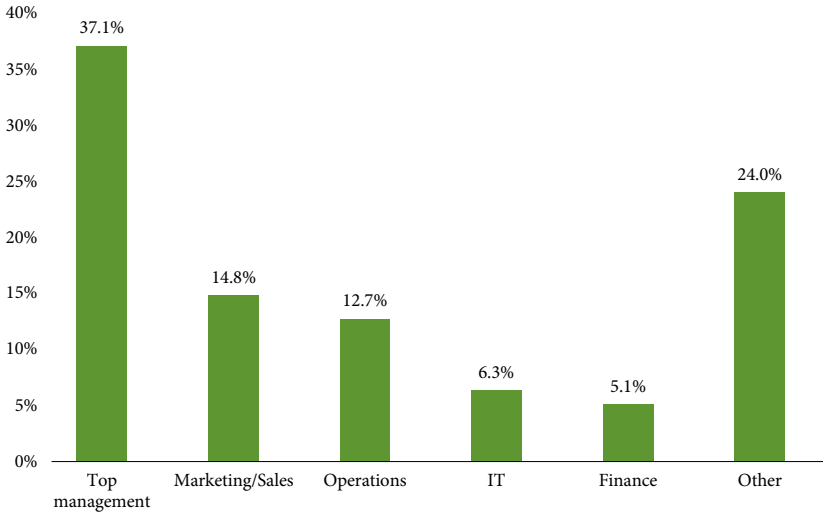


FIGURE 1 Role of Respondents

The majority of respondents (37.1%) were from Top management, followed by Marketing/Sales (14.8%), Operations (12.7%), IT (6.3%), and Finance (5.1%) (figure 1).

## Results

### OVERVIEW OF AI ADOPTION

#### *Organizations' Level of AI Integration and Experience*

Firstly, we classified organizations based on their primary interaction with AI. The responses indicated that 38% of organizations primarily act as end-users, 20.3% as suppliers, 22.8% serve both functions, and 19% do not engage with AI technology in these capacities.

The AI experience levels among surveyed organizations were categorized into four distinct levels. Notably, a significant portion (30%) has over a year of experience with AI, indicating advanced engagement and possible integration into their operations. These companies are likely the innovators of AI in Italy, aligning with Rogers' (2003) characterization of innovators as the first to embrace new technologies and drive industry transformation. Another segment (15.6%) is in the early stages of AI adoption, with experience ranging from six months to a year, suggesting they are scaling up their AI initiatives. These companies could be considered early adopters, as described by the DOI theory. Early adopters are distinguished by their strategic and influential role in validating

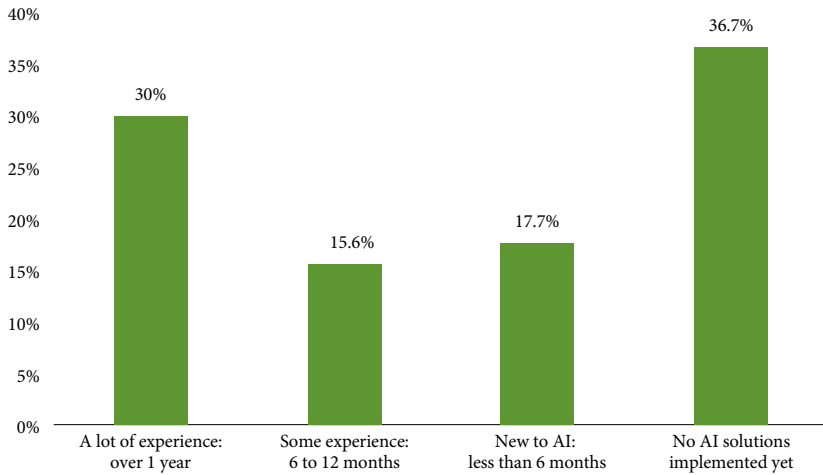


FIGURE 2 AI Experience Level in Companies

new technologies and accelerating their diffusion within the industry, although they may be slightly less mature in their AI adoption than the innovators (Rogers 2003). A slightly larger group is new to AI (17.7%), with less than six months of experience, likely exploring AI's applicability. A significant portion of companies (36.7%) have not yet adopted any AI solutions, likely indicating they are in the early stages of considering AI's potential benefits and challenges or lack the necessary resources, expertise, or strategic direction for AI implementation (figure 2).

A very weak negative correlation ( $-0.048$ ) between the organization's size and the level of AI adoption suggests that the size of an organization does not significantly influence its AI adoption stage. This counterintuitive result should, however, be treated with caution as the sample of responding companies was self-selected and could, therefore, suffer from selection bias.

### *Areas of AI Application*

The survey uncovers a wide array of AI applications being utilized within organizations, showcasing the diverse spectrum of AI technologies adopted across different sectors. Notably, 'Fraud/security' (55) and 'NLP/Chatbots/Language Processing' (65) applications are particularly prominent, indicating a strong emphasis on using AI to bolster security measures and enhance natural language processing capabilities, which are essential for the improvement of customer services, content engagement and higher security frameworks.

### *Managing Global Transitions*

The frequent mention of ‘Content creation/creativity’ (50 times) underscores a growing interest in Generative AI, suggesting that more individuals and organizations are increasingly recognizing its potential in this field. Additionally, the focus on ‘Experimenting/testing AI’ (60) within organizations underscores many companies are navigating the discovery or pilot stages of their AI endeavours.

As highlighted by the survey responses, the diverse application of AI technologies illustrates the widespread adoption and integration of AI into various organizational processes and services. It reflects the versatile potential of AI to tackle a broad spectrum of challenges and opportunities. This broad adoption and experimentation signal that organizations are still fine-tuning their strategic priorities and identifying the most impactful technological trends for their AI investments, indicating a landscape of evolving engagement with AI technologies.

Moreover, according to the DOI theory, this substantial portion of organizations actively exploring and testing AI aligns with the behaviour of both innovators and early adopters. Innovators are likely leading the charge with more exploratory projects, while early adopters are beginning to integrate AI in more structured ways across various applications. This broad distribution of AI experimentation points to a growing interest and potential for AI, signalling that the technology is transitioning from early adoption to more widespread, practical use.

#### DRIVERS AND EXPENDITURES FOR AI ADOPTION

##### *Key Drivers for Embracing AI*

The motivations for AI adoption vary among the companies surveyed. The primary motivations behind adopting AI are illustrated in figure 3. These motivations align closely with the characteristics of innovators and early adopters as described in Rogers (2003). This focus on enhancing internal processes is indicative of early adopters, who seek to leverage new technologies to optimize their operations and gain a competitive edge. Early adopters are often motivated by the practical benefits of innovation, using AI to streamline and enhance internal functions, which aligns with their more structured and strategic approach to technology adoption.

On the other hand, the 10.7% of respondents who reported no specific objective for using AI likely represent innovators. This group is characterized by their willingness to explore new technologies without a clear,

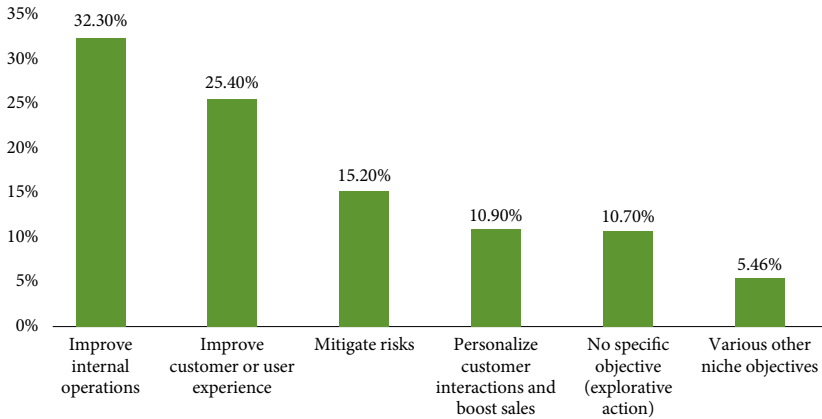


FIGURE 3 Key motivations for AI Adoption

immediate application in mind. Their approach is often experimental, driven by curiosity and the desire to be at the forefront of technological advancements. Innovators are crucial in the diffusion process as they help to identify novel applications and set the stage for broader adoption.

The motivations of other organizations, such as the 25.4% focused on improving customer or user experience, the 15.2% prioritizing risk mitigation, and the 10.9% using AI for personalized customer interactions and sales enhancement, also reflect the traits of early adopters. These companies are actively seeking to apply AI in ways that deliver tangible benefits, whether through enhanced customer engagement, reduced risks, or more personalized services.

The small fraction (5.46%) with niche objectives represents the diversity of AI's potential applications, further illustrating how early adopters are pushing the boundaries of AI usage in specific, targeted ways.

### *AI Expenditure*

We asked the respondents about the changes in AI expenditures in the last 12 months. The findings show a trend where most companies have either maintained or increased their investment in AI technologies, with only a minority reducing their spending (left pie chart in figure 4). Further inquiry into the investment forecasts for the next 12 months reveals a pronounced inclination among companies to either sustain or escalate their AI expenditure, with a significant portion projecting an increase (right pie chart in figure 4).

### *Managing Global Transitions*

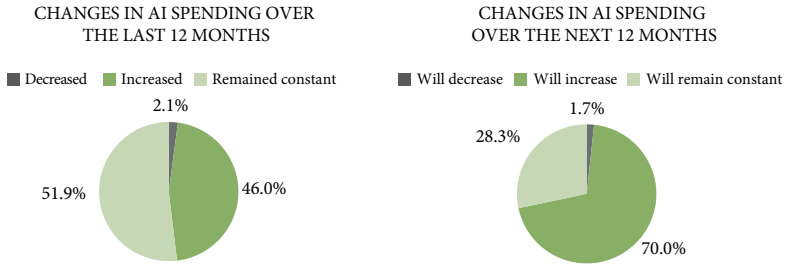


FIGURE 4 Changes in AI Spending

The significant increase in AI investment over the previous year reflects acceleration in adoption, underscoring the strategic importance placed by companies on AI technologies. This trend indicates a shift from viewing AI as a hyped phenomenon to recognizing it as a foundational component of strategic business planning.

Companies increasingly see AI as crucial for future growth, innovation, and competitive advantage. The evolving trend suggests that AI investment will become central to achieving business success and shaping future corporate landscapes.

This pattern of increasing AI expenditures aligns well with the DOI theory’s concepts of early adopters and innovators. The majority of companies maintaining or boosting their AI investments reflects the characteristics of early adopters, who strategically invest in technology to enhance productivity and gain a competitive edge.

**CHALLENGES AND BARRIERS AND PERCEIVED RISKS TO AI ADOPTION**

*Primary Challenges in AI Implementation*

The survey also probed participants about the primary challenges their company or organization currently faces with AI, aiming to gather insights into the hurdles encountered in harnessing AI’s full potential.

The survey reveals that the most pressing challenge faced by organizations in implementing AI is the significant gap in the availability of a skilled workforce (82). This includes not only AI professionals but also individuals with a general data and basic AI literacy, which are crucial for the effective implementation and management of AI projects. Additionally, many companies struggle to identify effective ways to integrate AI into their operations, indicating a lack of strategic clarity (49). The third major challenge is accessing high-quality relevant data, highlighting the essen-

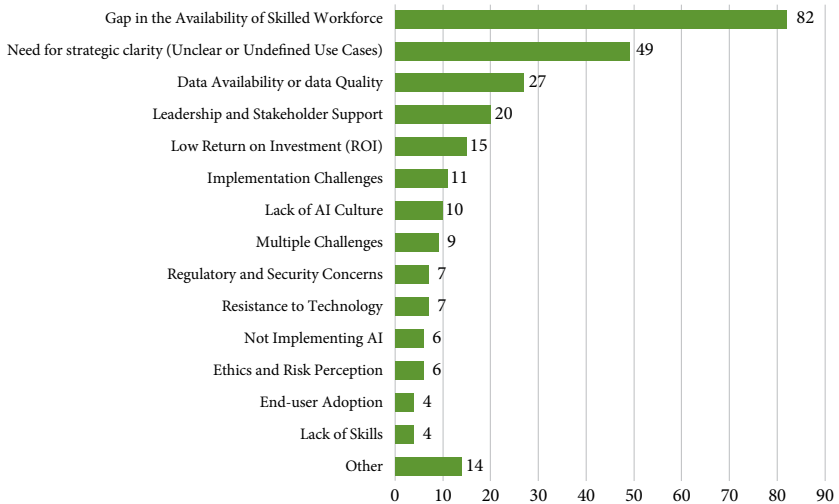


FIGURE 5 Primary Challenges in AI Implementation

tial role of data in maximizing AI's effectiveness (27). A fourth concern is the necessity of securing buy-in from top management and stakeholders, whose support is vital for providing the necessary resources and strategic direction (20). Concerns about the financial outcomes of AI investments also emerged, reflecting the difficulty in measuring and proving the expected benefits (15). Other identified challenges, including regulatory and security concerns (7), resistance to technology (7), and a lack of AI culture within organizations (10), underscore the complex and multifaceted nature of obstacles to AI adoption. Notably, some respondents reported facing multiple challenges (9) or were unable to identify a single predominant issue, illustrating the complexity of AI implementation. Figure 5 illustrates the frequency of these primary challenges in AI implementation.

These findings highlight the need for a multifaceted approach to overcoming challenges in AI adoption and align with the DOI theory, which posits that the adoption of new technologies is frequently impeded by gaps in knowledge and resources. Innovators, who are at the forefront of technology exploration, often encounter difficulties due to a lack of skilled personnel and strategic clarity. Early adopters, while progressing to more structured integration of AI, also face obstacles such as data access and securing management support.

Addressing these challenges is crucial for advancing beyond the initial experimentation phase and fully realizing AI's potential in organizational contexts.

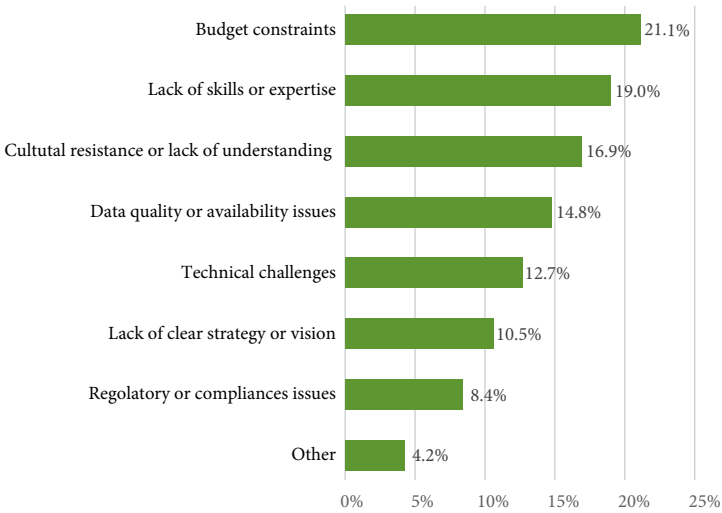


FIGURE 6 Barriers to AI Adoption in Organizations

### Barriers to AI Adoption

After asking respondents about the top challenges in AI adoption, we inquired about the primary organizational obstacles they believe their company or organization faces. Analysing these obstacles reveals the various issues companies and organizations may encounter, ranging from financial and cultural to technical hurdles. ‘Budget Constraints’, cited by 50 respondents, emerge as the primary impediment, spotlighting the substantial financial costs needed for AI adoption activities such as technology procurement, staff training, and system integration. ‘Lack of Skills or Expertise’, noted by 45 participants, points to a significant deficiency in AI competencies within organizations, highlighting the urgency for targeted education, skills development, and recruitment to bridge this gap.

‘Cultural Resistance or Lack of Understanding’, mentioned by 40 people, reveals that organizational culture and insufficient comprehension of AI’s potential benefits and applications can significantly stall AI adoption efforts. This underscores the necessity for effective change management and educational initiatives to mitigate such resistance. ‘Data Quality or Availability issues’, acknowledged in 35 responses, stress the critical importance of accessible, high-quality data for successful AI implementation.

‘Technical Challenges’, identified 30 times, encompass difficulties such as AI integration with legacy systems, scalability concerns, and the inherent complexity of AI technologies. Twenty-five people indicated a ‘Lack

of Clear Strategy or Vision’ as an issue, suggesting that the absence of a coherent strategic framework for AI deployment within the organizational objectives poses a notable barrier to its adoption. ‘Regulatory or Compliance Issues’, highlighted by 20 participants, reflect the intricate regulatory environment surrounding AI, pointing to privacy, security, and compliance as pivotal considerations (figure 6).

These findings underscore the challenges that both innovators and early adopters face in AI adoption. Innovators often encounter budget constraints and technical challenges as they experiment with new technologies, while early adopters must address issues such as skill deficits and cultural resistance as they integrate AI more systematically.

### *Perceived Risks Associated with the Use of AI*

In terms of concerns about the risks of AI, a significant number (50%) express ‘Somewhat concerned’ attitudes regarding AI’s potential risks, such as biases, inaccuracies, and plagiarism from AI-generated content. This reflects a cautious recognition of the adverse effects AI technologies may pose. Conversely, another group is characterized by ‘Extremely concerned’ responses (10%), indicating deep apprehension about AI’s ethical and operational hazards. This underscores the need for ethical AI development protocols, increased transparency, and stringent regulations to mitigate these concerns. A minority of people are not concerned, suggesting trust in current AI frameworks. According to the DOI theory, the minority who are not concerned could represent the innovators, as they are characterized by their pioneering spirit and willingness to accept higher risks for the sake of advancement. On the other hand, the 50% of respondents who are ‘Somewhat concerned’ reflect the cautious stance of early adopters. Their concerns suggest they are in the phase of refining their AI strategies and implementing safeguards, which is typical of early adopters who balance innovation with a need for effective risk management.

These findings highlight the importance of ongoing education and policy initiatives to address diverse perceptions and ensure comprehensive engagement in AI development and deployment processes.

## **GENERATIVE AI**

### *Business Engagement with Generative AI*

To assess the current impact of generative AI on Italian companies and organizations, survey participants were queried regarding their entities’ engagement with it.

### *Managing Global Transitions*



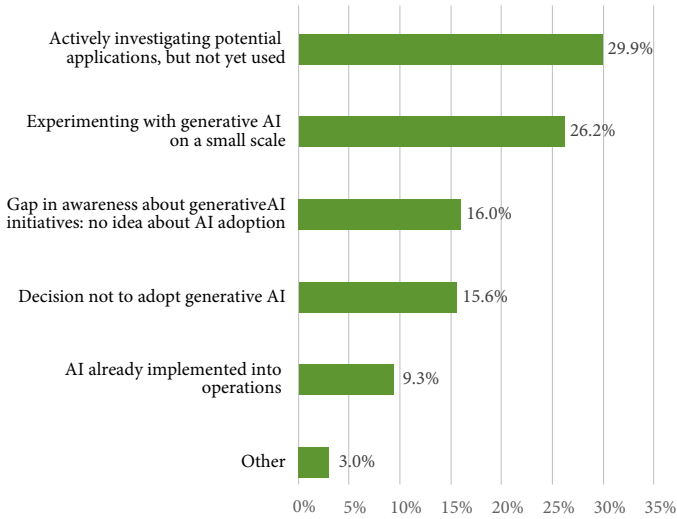


FIGURE 7 Business Engagement With Generative AI

The survey data reveals a varied landscape of engagement with generative AI among Italian companies, painting a dynamic picture of the business sector’s relationship with this emerging technology. A small but notable segment, 9.3% of organizations, represents innovators who have already integrated generative AI into their operations, leveraging its potential for competitive advantage and innovation. Early adopters, constituting 26.2% of the sample, are engaging in small-scale experiments, reflecting their proactive approach to understanding and applying AI strategically. Meanwhile, 29.9% of organizations are still in the preliminary stages, exploring AI’s potential without yet integrating it into their workflows. The 16% with gaps in awareness and the 15.6% who have opted against adoption due to resource constraints or perceived lack of relevance highlight ongoing challenges in communication and business education about AI technologies (figure 7).

### *Perceptions about Generative AI*

The survey reveals varying levels of engagement with generative AI among participants, which aligns with the DOI theory. The single respondent who identifies generative AI as a fundamental component of their business offering is likely an innovator. Therefore, we can assume that this organization has fully integrated AI into its core operations, reflecting an early and committed adoption of the technology. A notable number, 189 respondents (79.75%), view generative AI as valuable for

their organizations, demonstrating an optimistic attitude towards its potential and indicating that these companies are likely in the early adopter phase. This optimism is complemented by a smaller group of 23 participants (9.70%) who see potential benefits but also have concerns about reliability and safety, reflecting a cautious yet proactive approach typical of early adopters. On the other hand, 21 respondents (8.86%) find generative AI irrelevant to their business context, suggesting they may be in the late majority or laggard phases, possibly due to industry-specific constraints or limited relevance. Additionally, 3 respondents exhibit uncertainty or limited knowledge about generative AI, highlighting a need for further education and awareness.

### IMPACT AND FUTURE VISION OF AI ADOPTION

#### *AI Implementation across Organizations*

The inquiry into the extent of AI implementation across organizations revealed a nuanced landscape of adoption.

Interpreting these results according to the DOI theory, we can assume that the minority of organizations (9) with high levels of AI integration likely represent innovators, as they are at the forefront of AI adoption, having fully embedded AI across multiple operational domains. The 23 organizations (9.70%) pursuing extensive, organization-wide AI integration align with early adopters, demonstrating a proactive approach and readiness to embrace more comprehensive applications despite the associated challenges. In contrast, the substantial group of 118 organizations (49.79%) deploying AI in restricted or departmental contexts may be considered late majority or laggards, reflecting a cautious, exploratory approach to AI adoption. The 87 organizations (36.71%) without AI initiatives are likely laggards, either still contemplating AI adoption or not yet identifying viable applications for the technology.

#### *AI Decision-Makers and Implementers*

To explore the AI decision-making process, we asked respondents to examine the governance of AI project budget allocations within their organizations, aiming to identify who holds the authority to make these critical financial decisions and who is involved in the implementation of AI-based innovation projects. Regarding the decision-makers, a significant majority of the responses (181) pointed to the upper echelons of organizational hierarchy as the arbiters of AI project budgets. This un-

derscores the strategic valence attributed to AI investments, which typically necessitate senior management's endorsement, given their considerable implications for organizations' strategic trajectory and resource allocation. Conversely, a minority (35) of participants reported that such budgetary decisions for AI projects are entrusted to line managers. This implies a perception of AI initiatives as departmental endeavours, possibly of a tactical nature, rather than as strategic investments warranting the scrutiny and approval of the organization's top leadership. Additionally, a small fraction of responses was categorized under 'Other/Not Sure' (21), encapsulating those uncertain about the decision-making locus or scenarios that do not conform neatly to the established categories.

To delve deeper into the practicalities of AI implementation, a hierarchy of involvement has emerged regarding the parties executing AI projects within organizations. Technical teams – comprising IT, AI specialists, and other technical units – are identified as the primary contributors by 170 participants, underscoring the crucial role of technical expertise in leading AI initiatives. Additionally, business and strategy segments, including business development and executive roles, were significantly involved according to 90 mentions, highlighting AI's strategic importance beyond just technical execution.

'External Support' through consultants and specialized individuals accounted for 40 mentions, indicating a dependence on external knowledge for specialized skills or augmented capacity. Thirty participants claimed 'Uncertainty or Lack of Involvement', pointing to a discernible gap in AI project participation or awareness across some organizations. 'Research and Development', alongside 'Specific Functions or Projects' (12) like marketing or quality management, garnered less support, suggesting their more occasional involvement in AI projects. An isolated mention of 'Voluntary or Autonomous Use' hints at informal or individual-led AI explorations.

The survey results underscore a consensus on the importance of integrating business and strategy roles with technical teams in AI project implementation to ensure AI initiatives align with organizational goals.

### *AI: Unleashing New Frontiers of Creativity*

In the context of increasing academic interest in exploring AI's potential to enhance individual creativity, our study invited respondents to assess their perceptions of innovative corporate ideas and creative contributions to organizational practices. The statistical analysis reveals a gener-

ally favourable view among participants regarding AI's role in boosting creativity and generating novel beneficial ideas within organizations.

When examining perceptions of the main sources of organizational creativity, the analysis highlighted a predominant belief in the collaborative synergy between human creativity and AI tools (120 respondents). This perspective underscores the potential of human-AI collaboration in creative endeavours. Conversely, another prevalent viewpoint emphasizes the virtues of intrinsic human creativity independently of AI assistance, stressing the enduring value of human ingenuity (80). Finally, a smaller group of respondents expressed uncertainty about the primary contributors to creativity (20), reflecting either indecision or a neutral stance on the issue.

Therefore, while there is growing recognition of the benefits of integrating AI with human creativity, a significant portion of individuals and organizations still prefer traditional methods or remain hesitant to fully adopt AI. According to DOI theory, the successful spread of AI as a creative tool will depend on clearly demonstrating its advantages, compatibility, and ease of use.

### *Visioning the Future: AI's Impact on the Workforce*

The concluding results of the survey delve into participants' perceptions regarding the future impact of AI on the workforce within their organizations. Uncertainty dominates, with a significant number of respondents (44.7%) expressing ambiguity regarding AI's future implications for employment and work procedures. This uncertainty underscores a collective hesitation about predicting AI's effects on the job landscape. However, a subset of 55 participants (23.2%) reveals optimism about AI's capacity to generate new job roles, pointing towards a hopeful stance on AI-driven employment opportunities. Additionally, 40 respondents (16.9%) envision AI as augmenting existing jobs and enhancing efficiency and productivity, which suggests a positive anticipation of AI supporting human work rather than supplanting it. Concerns about the necessity for workforce upskilling and reskilling emerge from 30 mentions (12.7%), indicating an expectation that AI will shift skillset demands.

A nuanced perspective is offered by 25 respondents (10.5%), who recognize AI's dual potential to create and displace jobs, acknowledging the complex and multifaceted nature of AI's impact on employment. Meanwhile, 20 participants (8.4%) voiced concerns over job losses due to automation, highlighting fears of AI-induced redundancy. A minority view

held by six individuals (2.5%) posits that AI will not significantly disrupt workforce trends, reflecting either scepticism towards AI's transformative capacity or confidence in the workers' resilience. Interpreting the results through the lens of innovators and early adopters, we can identify the innovators as those respondents who are optimistic about AI creating new job opportunities. Early adopters are those who see AI as a tool to enhance existing jobs and increase productivity. They are not as radical as the innovators but are still proactively integrating AI into their workflows.

## **Discussion**

### **THEORETICAL CONTRIBUTIONS**

This study contributes to the Diffusion of Innovation (DOI) theory (Rogers 2003) by enhancing our understanding of the characteristics and roles of innovators and early adopters within the context of AI adoption. Our research adapts these adopter categories to the AI landscape, aligning with existing literature while offering nuanced insights specific to the Italian setting.

We argue that, in the realm of AI, innovators are defined by their proactive risk-taking and willingness to explore uncharted technological frontiers. These pioneers lead AI adoption by experimenting with the technology in its nascent stages, driven by a quest to discover its potential without immediate practical applications. Their role is crucial in identifying novel uses for AI and setting the stage for broader industry transformation.

Regarding early adopters, we posit that these organizations, while also at the forefront of AI adoption, approach the technology with a more measured evaluation. They play a significant role in assessing the strategic value of AI, often influencing wider industry trends by validating the technology's practical benefits. Early adopters strategically integrate AI to enhance operational efficiency, serving as a bridge between innovation and broader acceptance.

The presence of both innovators and early adopters, comprising approximately half of the sample, enhances the literature on these leading adopter categories (Lund et al. 2020; Raman et al. 2024), stressing their significance in the diffusion of AI technologies. It underscores their distinct roles in driving AI's adoption and integration within the Italian context.

Moreover, this exploratory study addresses a gap in exploring AI knowledge and integration in the Italian context, enriching the academic dialogue on global AI integration strategies. It offers an optimistic perspective on AI's potential impact on employment, predicting net job creation and viewing AI as a tool that will augment existing roles while boosting efficiency and productivity. This implies a belief that AI will support, rather than replace, human work.

Additionally, our study contributes to the literature by demonstrating the progression of AI adoption along the innovation curve. We provide evidence of increasing AI spending, highlighting early adopters and validating AI's critical role in and driving its integration into mainstream business practices. As AI becomes central to business strategy, we expect to see accelerated adoption of these technologies across industries.

Finally, our study advances the literature on innovation and creativity by highlighting AI's role in enhancing creative capabilities. It suggests that AI, in conjunction with human input, can act as a catalyst for both innovation and efficiency. This aligns with and extends existing theories on technology-driven competitive advantage, providing new insights into how AI can be strategically leveraged as a valuable asset in the digital age.

#### MANAGERIAL IMPLICATIONS

This exploratory study provides valuable insights for managers navigating the complexities of AI implementation and seeking to leverage it for innovation and sustainable competitive advantage. Our research yields the following recommendations:

1. *Strategic AI Investment*: Position AI as a core strategic priority, focusing on infrastructure and talent development (Mikalef et al. 2021; Bharadwaj et al. 2013).
2. *Versatile Application*: Explore AI's utility across various business facets, beyond traditional boundaries (Raisch and Krakowski 2021).
3. *Addressing Skills Gap*: Upskill existing employees, attract new talent, and foster interdisciplinary collaboration (Kapoor and Ghosal 2022).
4. *AI-Friendly Culture*: Cultivate an atmosphere encouraging experimentation and creative AI implementation (An et al. 2024).
5. *Robust Data Management*: Establish high-quality data practices, particularly crucial for descriptive and predictive AI (Mikalef and Gupta 2021).

6. *Ethical AI Deployment*: Develop guidelines for transparent, accountable, and fair AI use (Bostrom and Yudkowsky 2018).
7. *Workforce Transformation*: Plan for AI-induced changes, including new role creation and reskilling (Brynjolfsson and McAfee 2014; Budhwar et al. 2023).
8. *Cross-Functional Integration*: Ensure seamless AI deployment across departments (Mikalef et al. 2021).

To implement these strategies effectively, organizations should integrate AI into their planning processes, aligning with overall objectives. Addressing skills gaps through targeted training and recruitment is crucial for cultivating a workforce adept at leveraging AI technologies.

Creating an innovation-friendly culture encourages experimentation and learning from both successes and setbacks in AI projects. Robust data management practices are foundational to AI success, while establishing ethical guidelines and governance structures helps mitigate risks and build stakeholder trust.

As organizations prepare for AI-driven transformations, focusing on upskilling, reskilling, and developing complementary roles becomes vital. Fostering cross-functional collaboration supports a more integrated approach to AI implementation, dismantling organizational silos.

By following these recommendations, practitioners can effectively leverage AI to drive business success, gain a competitive edge, and position their organizations as leaders in technological innovation. This comprehensive approach ensures that AI implementation is not merely a technological upgrade but a transformative process enhancing all aspects of the organization.

#### FUTURE RESEARCH DIRECTIONS

Emerging from our exploratory study, we outline various trajectories for future research that merit deeper investigation to achieve a more comprehensive understanding of AI's transformative impact on organizations. These areas include improving AI skills and training within organizations by exploring effective strategies for closing the AI skills gap; fostering cross-functional collaboration on AI projects by identifying best practices for cross-departmental collaboration; addressing ethical concerns and data quality issues in AI implementation by establishing ethical guidelines for the responsible use of AI; exploring the role of AI in the evolution and creation of jobs; examining the impact of AI on

organizational innovation; and tracking trends in AI adoption over time by conducting longitudinal research to monitor evolving trends and their drivers.

### **Conclusions**

In conclusion, our exploratory study of 237 Italian companies uncovers increasing enthusiasm and adoption of artificial intelligence (AI) technologies, marking a significant step towards digital transformation in the Italian business environment.

Our study reveals a heterogeneous landscape of AI adoption in Italy, with both innovators and early adopters present. While most companies are in the initial stages, some have already integrated AI into core operations. This aligns with the Diffusion of Innovation (DOI) framework, strengthening our theoretical grounding. The observed increase in AI expenditures indicates progression along the innovation curve, with early adopters validating AI's utility and driving its integration into mainstream practices.

The study highlights the essential role of AI for Italian companies, not only as a mechanism to improve operational efficiency but also as a key element in driving innovation, securing competitive advantage, and achieving long-term growth. The challenges identified, such as the need to bridge skills gaps, improve data management practices and address ethical concerns, point to crucial areas that require immediate attention and further exploration. These findings suggest that the DOI theory provides a useful framework for understanding the adoption of AI.

As we stand on the cusp of a transformative era in business technology, it is imperative that these issues continue to be explored to ensure that the integration of AI is both impactful and conscientious. This research not only provides a basis for future studies, but also charts a comprehensive course for the ongoing assessment of AI's influence on the evolution of the Italian business landscape.

While this study offers insights into AI adoption in the Italian business sector, it has limitations. The research is confined to Italy, studying a sample of 237 companies, which may limit generalizability. The conventional sampling method could introduce selection bias, potentially not reflecting the broader Italian corporate landscape. Future research should address these issues by expanding the sample size and employing a randomized sampling strategy to enhance representativeness and applicability.



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### Appendix: The Survey

The purpose of the survey is to assess the level of adoption of artificial intelligence (AI) technologies, particularly generative AI, and trends for the near future. The estimated time to complete the survey is approximately 10 minutes. The survey is divided into 5 main sections:

1. The first section is dedicated to gathering general information about the organization and the profile of the respondents.
2. The second section is dedicated to understanding the level of adoption of AI technologies.
3. The third section is dedicated specifically to generative AI.
4. The fourth section is dedicated to the implementation aspects of AI.
5. The fifth and final section is dedicated to the organizational aspects of AI.

#### (1) General information

\* Indicates required question

1. Name of the organization/company\*
2. Number of employees\*
3. Activity code (ATECO)
4. Postal Code\*

5. Email (of the person completing the questionnaire if they wish to receive the results of the research)
6. Area (of the person completing the questionnaire)\*. *Please select one answer:*
  - Top management
  - IT
  - HR
  - Marketing/Sales Operations
  - R&D
  - Other:
7. Level of responsibility (of the person filling in the questionnaire)\*. *Please select one answer:*
  - Apical
  - Head of function
  - Team leader
  - Employee/collaborator
  - External consultant
  - Other:

**(2) Knowledge and adoption of AI technologies in your company/organization**

8. Which best describes the role of your company/organization with regard to AI technology? *Please select one answer:*
  - My company/organization is mainly an end-user (buyer)
  - My company/organization is mainly a supplier (seller)
  - My company/organization is both end-user and supplier (both)
  - My company/organization is neither end-user nor supplier (none)
9. What is your company/organization's level of experience with AI?  
\* *Please select one answer:*
  - We have not yet implemented any AI solutions
  - We are new to AI: less than 6 months
  - We have some experience with AI: 6 to 12 months
  - We have a lot of experience in AI: more than 1 year
10. What are the main goals of using AI in your company/organization? \*  
*Check all that apply*
  - Improve customer/user experience; Improve internal operations
  - Recommend products/services; Mitigate risks
  - We do not have a specific objective
  - Other:

11. Which of the following AI applications do you use in your company/organization? *Check all that apply:*
  - Anti-fraud/security; Artistic vision
  - NLP/chat/messaging/text...
  - Content creation/creativity...
  - Robotic Process Automation...
  - Recommender systems
  - We are experimenting/testing AI; We are not using AI
  - Other:
  
12. How has your company/organization's AI spending changed in the last 12 months? *Please select one answer:*
  - Has remained constant
  - Has increased
  - Has decreased
  
13. How do you expect your company/organization's AI spending to change in the next 12 months? *Please select one answer:*
  - Will remain constant
  - Will increase
  - Will decrease
  
14. What is the main challenge your company/organization faces with AI? *Please select one answer:*
  - Insufficient support from leaders or stakeholders
  - Inadequate availability or quality of data
  - Limited talent or resources
  - Unclear or undefined use cases
  - Low return on investment
  - Other:
  
- (3) Adoption of generative AI (such as ChatGPT, Midjourney, Copilot, Dall-E, Bard, Claude, ...) in the enterprise**
  
15. How would you describe the level of involvement of your company/organization with generative AI? *Please select one answer:*
  - No idea
  - None: we are not considering it or have ruled it out
  - We are looking at possible applications, but have not used it yet ...
  - We are experimenting with generative AI on a small scale
  - We have implemented generative AI in our operations
  - Other:

16. What are your thoughts on the use of generative AI for your company/organization?\* *Please select one answer:*
- I think it can be useful, with appropriate precautions
  - I think it is not applicable or useful for my business
  - I think it is applicable but not affordable or safe enough for my business
  - Other:
17. Does your organization plan to use generative AI in accessing and exploiting your company/organization's knowledge base? *Please select one answer:*
- Yes
  - No
  - Maybe
  - Don't know
  - Not applicable
18. If your company/organization uses generative AI, are you using non-proprietary models such as ChatGPT or are you using proprietary models that do not involve sharing company data with others? *Please select one answer:*
- Mainly non-proprietary models
  - Both types of models
  - Non-proprietary only if from partners
  - Mainly proprietary models
  - Don't know
  - Not applicable
19. Are you concerned about the risks of AI, e.g. bias, accuracy, plagiarism, hallucinations? *Please select one answer:*
- Extremely concerned
  - Somewhat concerned
  - Not at all concerned
20. How much do you think AI is able to help creativity in the company/organization?\*
- Choose an answer from 1 to 7. 1 is "not at all" and 7 is "extremely":*
21. Does the use of AI make it possible to produce new and useful ideas for improving processes in the company/organization?
- Choose an answer from 1 to 7. 1 is "not at all" and 7 is "extremely":*
22. In general, where do you think the greatest contributions to the creativity of the company/organization can come from? *Please select one answer:*

- From creative people without using AI
- From people using AI
- From AI alone
- Don't know
- Other:

**(4) Implementing AI in your company/organization**

23. How did you obtain the necessary data for your AI applications?\* *Check all that apply:*

- We used our own data
- We used crowdsourcing; We used synthetic data
- We bought it
- We were unable to obtain the necessary data; We used search engines
- Other:

24. What are the major findings in preparing the necessary data for AI applications?\* *Check all that apply:*

- Lack of data
- Lack of structured data
- Data privacy
- Data distortion
- Data normalization
- Data labelling
- Data quality
- Other:

25. Does your company implement AI on a large scale, i.e. integrated throughout the company/organization? *Please select one answer:*

- We are not implementing AI at all
- We are implementing AI mainly not on a large scale
- We are in the process of moving to large-scale AI, but we are not there yet
- We are implementing AI on a large scale (integrated throughout the company)

**(5) Organizational processes and AI in your company/organization**

26. Who decides the budgets for AI projects in your company/organization?\* *Please select one answer*

- The executive level (CEO/CTO)
- The line managers
- The individual users
- Other:



27. Who is involved in the implementation of AI projects in your company/organization?\* *Check all that apply:*

- Each line of business
- The IT team
- The consultants
- The AI team
- Other:

28. In your opinion, who should be involved in the implementation of AI projects in your company/organization? *Check all that apply:*

- Each line of business
- The IT team
- The consultants
- The AI team
- Other:

29. How do you think AI will influence the workforce of your company/organization in the future? *Please select one answer:*

- AI will create more jobs
- AI will reduce the number of jobs
- Not sure
- Other:

.....

30. What do you think are the main organizational barriers to the adoption of AI in your company/organization? *Check all that apply:*

- Too little sponsorship from the leadership ...
- Lack of skills
- Few resources
- Other higher priorities
- Lack of use cases
- Lack of availability of adequate data
- Other:

.....

31. What are your general thoughts on the adoption of AI-based technologies, in particular generative AI, and on trends for the near future? *Open question:*