

Regulations hindering or enabling digital innovation?

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Short episode

On 21 April 2021, a new proposal for a regulation on Artificial Intelligence was published by European Commission. The EU AI Act defines AI and determines requirements for the development of ethical AI systems: identifying what and whom will be affected by the regulations. A few weeks later, Sam and Frank as part of the Deloitte Risk Advisory after finishing a meeting with a large client about an AI project, set a meeting to discuss together how they need to respond to that. They knew that the new proposal is significantly changing the development of AI in different sectors. They reflected on how they can better support client organizations when uncertainty is high, and things might change with new regulations. Over the last months, they learned that the regulation influence not only their development process and implementation of AI systems, but also their approach to supporting other companies.

What was obvious to them was that this will be not the last time they discuss regulations and compliance requirements for digital innovation. Every time that a new legal framework will be proposed or come into force, they need to respond to such regulations.

Overview

Digital technologies are rapidly shaping how organizations create and capture values. In particular, many small and large, private and public organizations are adopting Artificial Intelligence (AI) in different sectors from banking, health, public administration, and education. AI uses a large amount of data to classify, predict or provide responses. AI is changing our everyday lives and experience: many individuals now use Alexa and Siri or interact with chatbots and AI selects many of the adv we are exposed to and it designs some of the products we buy.

However, evidence¹ illustrates ethical issues and risks that affect organizations, governments and individuals. Such issues and risks have forced government and regulatory bodies to revise regulations and policies. EU AI Act² is one example of regulatory efforts to avoid unintended financial or reputational loss. Regulations and policies have direct implications on how organizations develop, implement and use digital innovation, including AI (Nambisan et al. 2019).

In this teaching case, we focus on the development of AI-based innovation by management consulting firms. The value proposition of most management consulting firms now includes the development and implementation of digital innovation, including AI-based innovation (Tavoletti et al. 2021). Due to the specificities of the technologies, many organizations willing to implement digital innovation rely on the help of management consulting firms that therefore play a central role in enabling digital transformation. Considering the increasing demand for businesses to adapt and use AI, many management consulting firms are compelled to develop use cases for various businesses aiming at improving their business processes. For example, financial institutions use AI in loan decisions or fraud detection. The main challenge for management consulting firms then relates to the tension between clients' demands for innovation and the pressure by regulatory bodies in developing and using AI in compliance with changing regulations and policies. The evolving regulations and policies on AI make it difficult for organizations to develop, implement, maintain and use AI. Thus, the teaching case explores the tension between the need for innovation and compliance with emerging regulations.

The teaching case introduces characteristics of digital innovation and risks associated with the use of AI. Moreover, it highlights the challenge in developing AI as regulations are evolving and new requirements (Burt 2021) are put into practice.

1. See for examples: <https://www.theguardian.com/technology/2018/oct/10/amazon-hiring-ai-gender-bias-re-recruiting-engine> and <https://www.scientificamerican.com/article/racial-bias-found-in-a-major-health-care-risk-algorithm/>.
2. <https://artificialintelligenceact.eu/>.

Brief summary of the management consulting firms

Operating in knowledge-intensive sectors, the main product of management consulting firms (MCFs) is knowledge (Sarvary, 1999). MCFs play an important role in the diffusion of knowledge and support client firms in achieving their organizational objectives by identifying and solving problems, exploring and exploiting new business opportunities and change management (Kubr, 2002). As business and technological uncertainty increases, firms increasingly rely on knowledge of MCFs for innovation management (Birkinshaw et al., 2008). Especially regarding digital transformation, MCFs support organizations to grow their businesses and define their digital transformation strategy by aligning IT strategy with business strategy (FEACO, 2019). The client firms can be large organizations, small or medium organizations, entrepreneurs or public companies.

To respond to those changes and remain competitive, MCFs had to rethink their value propositions by moving beyond providing guidelines or recommendations – “solution shop” (Christensen et al., 2013) to developing, prototyping and implementing digital solutions [2]. Looking at general trends in the last years, Technology consultancy became one of the main service lines of management consultancy (FEACO, 2022), as digital technologies introduce new opportunities. Thus, many MCFs offer strategy advisory, risks advisory or “technology-driven consulting” services (FEACO, 2019). Despite the health emergency in 2020, management consultancy projects have increased as client firms sought further support in redefining their business strategy and managing risks.

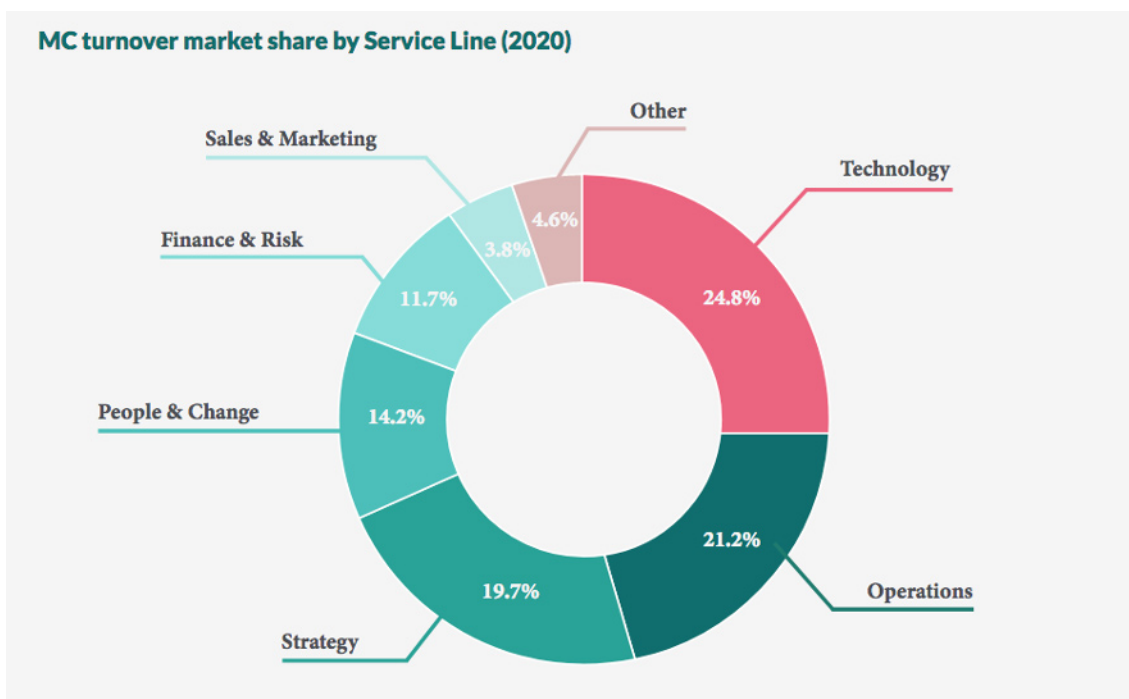


Figure 1- Source: FEACO, 2022

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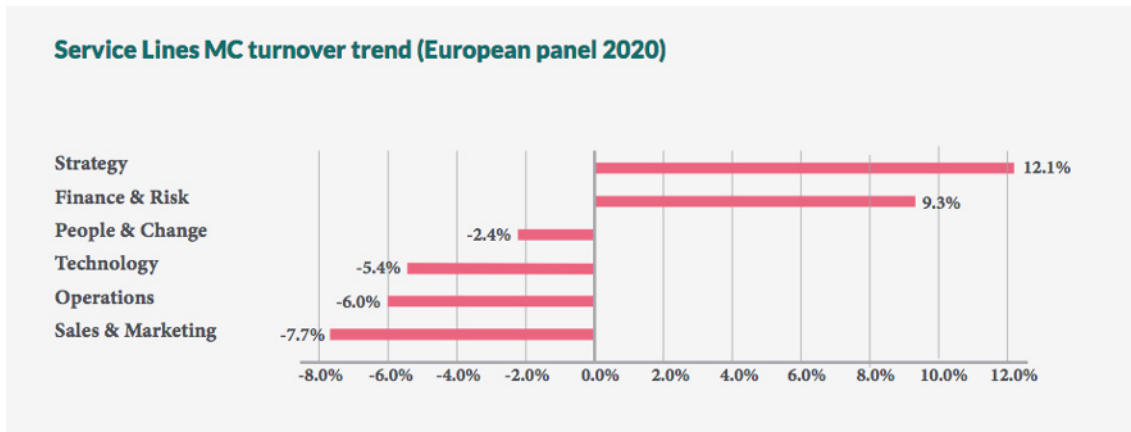


Figure 2- Source: FEACO, 2022

Data and AI tools

Companies are increasingly developing and adopting AI solutions for task performance. The applications of AI include automation -when the tasks are performed by the machines- and/or augmentation- when there is a collaboration between human agents and machines (Raisch and Krakowski 2020).

AI tools support organizations to reduce the time of operations, increase efficiency by automating routine tasks, support decision-making processes, detect fraud and reduce risks, and gain new insights on value creation.

The development of AI tools relies on digital data. By exploiting different types and sources of data, AI tools can show new patterns within data (Elish and Boyd 2018). For AI-based solutions, data are created, collected, accessed and combined both at intra-organizational and inter-organizational levels. At the same time, organizations need digital infrastructures to store, process and analyze the vast amount of data and use AI. This leads to the emergence of ecosystems of actors who directly or indirectly engaged in data management practices, providing infrastructure (e.g. cloud) and data.

Ethical issues of AI

The growing business opportunities lead to the use of AI in different functions (manufacturing, human resource, marketing, etc.) and different sectors from agriculture and education to finance and health. Although the ethical issues of AI are not new, the ubiquitous use of AI raises the concern about ethical issues by governments, experts, managers and users. AI systems may entail several ethical issues during the development and deployment of AI.

Biases: AI systems are trained and learn from data. For this purpose, data are generated, collected or integrated by different actors and by different means (e.g. sensors, human interactions on social media, etc.). However, data are not entirely objective. In other words, data do not fully represent reality and how data are generated or processed may contain assumptions. Therefore, datasets contain biases. Evidence illustrates several examples of bias in the outcomes of AI resulting from biases in datasets³.

Violating privacy: Following “the more, the better” logic for training AI, many companies seek to collect and integrate a vast amount of data generated by users on their platforms. While some data are inserted voluntarily by users (e.g. the date of birth), companies more and more collect and use data generated by users on their platforms (e.g. comments and likes on social media) even without the consent of users (Krämer 2020). Using personal data for AI may violate privacy.

Black-box nature: Understanding how AI makes decisions or recommendations is another concern. It becomes an important question when the AI system produces an unexpected or unintended outcome. Due to the black-box nature of AI, companies cannot explain or control the AI system. The lack of transparency over AI could have significant consequences for companies⁴.

3. See for example: <https://www.theguardian.com/technology/2018/oct/10/amazon-hiring-ai-gender-bias-recruiting-engine>.

4. See for example: <https://www.nbcnews.com/news/us-news/united-boss-dragged-passenger-was-disruptive-belligerent-n745031>.

The regulations landscape

Regulations enforced by governments aim to regulate the activities and behavior of actors (Blind et al. 2017). Although in the past years, we are witnessing that the changes in regulations and rules do not keep up with the pace of technological progress, the EU has been active in regulating the digital economy more strictly. Regarding data, by emphasizing the role of data for the economy, Europe has taken steps towards a data strategy. One example of regulation in Europe was the EU General Data Protection Regulation (GDPR) which came into force in May 2018. The GDPR introduces legislation to protect personal data by expanding the rights of consumers, expanding the scope of responsibility in actors processing and accessing data and ensuring compliance, increasing fines on non-compliance companies and timely data breach reports. The GDPR affects how companies process what data, who should be notified, and when in case of a data breach. Table 1 presents other initiatives by Europe in order to create a situation where actors (people, organizations, and authorities) can share data for innovation while protecting data subjects and data.

Action	Description
GDPR	Data protection and privacy
Data Governance Act	Governance of data access and use Promote data sharing Focus on Trust
Digital Market Act	Regulate the market power of platforms and address anti-competitive practices by platforms
Digital Service Act	Responsibilities of service providers to create a secure and safe online environment
Data Act	Encourages data sharing New rights on data to access and/or control
AI Act (proposal)	Regulations of AI use and promote the development and use of AI compliance with regulations

In this section, we focus on AI Act which was proposed by the European Commission in April 2021.

The **AI Act** will apply to actors engaging in developing, using, and distributing AI systems within the EU region: actors own and develop AI systems using data of or influence the EU citizens; actors engaging in AI systems used in the EU region (importing AI from other countries outside of the EU or making the AI system available); actors that use AI system in the EU region. Infringements or non-compliance with such regulations can result in a significant fine. It also includes penalty clauses for communicating incorrect information about AI systems.

The AI Act determined also reporting structures and roles and responsibilities of engaged actors as follows:

- AI developers and providers: for the application of AI in the EU, for instance, developers should ensure compliance and monitor and assess the conformity of their AI system.

- Importers and distributors: Actors who import AI from other countries outside of the EU or make the AI system available in the EU are responsible and are not allowed to place non-compliance AI on the market.
- Users: Actors using.

The regulation of AI concerns addressing the ethical issues in the application of AI systems, and how and what data are used for the development of AI systems. By making a distinction between high and low-risk AI systems, the regulation legally prohibits the application of AI systems for social scoring or manipulation of citizen decisions, while setting requirements and obligations for other AI systems based on the level of risk (see Figure 3).

In a nutshell, the new proposal aims at ensuring that AI is developed considering ethical principles, and considering safety, privacy and transparency: in other words, to ensure that the AI system has no negative impact on people.

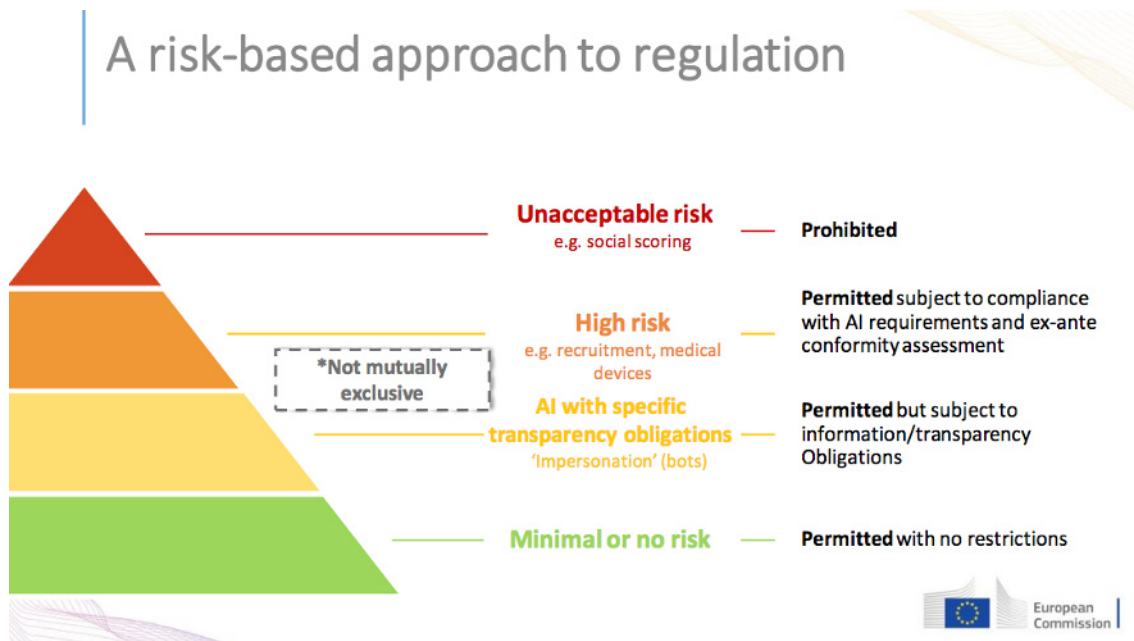


Figure 3- Risk-based approach to regulation source: <https://artificialintelligenceact.eu/the-act/>

Regulatory Sandbox

The inherent nature of digital technologies (including AI) can be regulated by more flexible regulatory frameworks (Attrey et al. 2020). Considering digital technologies, regulations often lag behind the pace of innovation. AI Act introduces a regulatory sandbox on AI to facilitate innovation, mitigate and manage risks of new technology. This will encourage small and medium size companies to innovate and at the same time reduce the cost and burden of regulatory compliance. Sandboxes are defined “as concrete frameworks which, by providing a structured context for experimentation, enable where appropriate in a real-world environment the testing of innovative technologies, products, services or approaches (...) for a limited time and in a limited part of a sector or area under regulatory supervision ensuring that appropriate safeguards are in place” (European Council 2020). The regulatory sandbox provides an environment for interactions between regulators and innovative companies, where AI projects can be developed and tested to ensure compliant innovation.

Regulating Digital Innovation

To enforce new regulations to influence the activities and behavior of actors, regulatory bodies have a challenging task: on one hand, they must protect citizens and ensure a fair market for all actors; on the other hand, they have not to discourage digital innovation and impede flourishing new business models. This tension between responsibility and innovation inherent in AI systems needs to be balanced (Tregove and Kazim 2022). The tendency toward exploring and exploiting AI in different business domains and sectors is in conflict with avoiding and controlling AI technologies. Neither restrictive regulations nor lax regulations for AI are promising: restrict regulations constrain innovation; lax regulations promote non-compliance products and without mitigating risks which could lead to significant consequences for companies, society and government (e.g. manipulating citizens' decisions due to under-regulation lead to undesirable political and financial outcomes).

Another challenge for regulators in regulating the market is associated with fragmented rules and regulations in different sectors and countries. The critical sectors such as health and finance sectors have a diverse set of requirements when it comes to data and AI, and thus demand sector-specific rules and regulations. Comparing the regulatory landscapes of the UK, the EU and the United States show also different levels of severity and enforcement (Tregove and Kazim 2022).

Possible scenarios for responding the new enforced regulations

The new laws and regulations require companies to be accountable for their data management practices (e.g. data collection) and the development and use of AI. Companies in different regions and sectors are forced to comply with waves of new laws and regulations. In some cases, the fines on non-compliance companies and the level of supervision were significantly increased. Some companies perceive the regulations as an entry barrier: the entry barrier is higher for companies operating in regions with restrict regulations than those operating in regions with a laxer regulatory framework (Wallace & Castro, 2018). Moreover, the enforcement of new regulations results in compliance costs: companies need new resources (e.g. human and financial resources) to meet the new regulations. These together with the restriction on the deployment of AI for certain uses lead to less incentive for innovation.

The enforcement of new regulations can be seen as constraint on innovation. In responding to constraints introduced by the regulation, companies have four options (Stewart, 2010; Martin et al., 2019):

Option 1: to abandon innovative ideas which became complicated with the new regulations or require enormous resources and changes in the innovation process. As compliance cost is high and compliance management problematic, companies prefer not to pursue (even promising) ideas. Some factors that push companies to abandon innovation are the strict rules and regulations; the enforcement of new regulations which create uncertainty for companies about whether their products, services or business models are compliant.

Management consulting firms need also take into consideration the preferences of their clients when it comes to regulation. Clients operating in the financial or health sectors may be more reluctant to start a new project based on AI since the market is highly-regulated, and clients have additional concerns about compliance. This reduces the tendency to innovate and constrains innovation in the digital economy.

Option 2: to comply with regulatory requirements. Companies can develop products or business models in compliance with regulations. This introduces some changes in the innovation process: what and how data are collected for AI projects, how data are processed by who, what are compliance measures to be followed by developers, where and how AI can be used and for what purpose.

However, while the new rules and regulations are enforced, then the question is how to ensure compliance of innovation projects already under development or deployment. This increases the compliance burden as further efforts are required to track and maintain compliance. Complete compliance may also ask for changes in infrastructures or service providers/suppliers.

The factors that push to follow this option include the strict regulatory enforcement by regulatory bodies, and the high market demand for compliant products/services by clients, users and/or citizens. In particular, in highly-regulated sectors/markets, compliance acts as a prerequisite for market entry. Without compliance, the companies cannot play in the market.

However, due to ever-changing the nature of regulatory framework and compliance costs, a company may wait to see how other companies respond and then decide whether and how to pursue their AI innovative ideas.

Option 3: While some firms are waiting to see how the new regulations impact the other companies or the sector, and then decide whether and how to develop their AI projects, some opt to be reactive to the regulatory framework. They not only predict the future of rules and regulations and iteratively monitor compliance and redesign and develop AI projects, but also develop new tools and technology to facilitate compliance. One implication of such an approach is to promote compliant innovation by reducing the compliance burden and costs. This creates new business opportunities for startups and third-party providers introducing technologies to assist other companies to achieve and manage compliance.

Option 4: to neglect the regulatory framework and develop non-compliance products. This approach gives too much weight to innovation raising the tension between innovation and responsibility. The factors that push for this to follow this option are non-strict regulatory enforcement, and low-to-medium market demand for compliance products. In regions where the regulatory framework is weak, or some uncertainty exists, a non-compliance approach might be like operating in “gray zones”: it is not crystal-clear what practices are legal or illegal. When the risk or non-compliance cost is low, companies see developing non-compliance products as the only option. However, if the enforcement of regulations becomes stricter over time, this approach leads to short-term gains as a company later may decide to abandon the project.

Case Description

Deloitte offers Audit & Assurance, Consulting, Financial Advisory, Risk Advisory, Tax and Legal services to public and private clients belonging to multiple sectors. Thanks to a network of companies present in over 150 countries, Deloitte uses international skills and a deep knowledge of the local area to help customers achieve their business objectives.

In Italy, Deloitte is one of the largest companies in professional business services, where it has been present for about 100 years. The services are offered by various companies and firms specialized in individual professional areas, all part of the Deloitte network. Deloitte's over 11,000 professionals assist several thousands of customers in achieving excellence thanks to the high quality of the service offered, the multidisciplinary approach and widespread presence throughout the country. Deloitte Risk Advisory enables clients' success through trust, resilience, and safety.

The development of AI projects at Deloitte Risk Advisory

The methodology adopted by **Deloitte Risk Advisory** is an iterative approach to AI development projects starting by exploring and selecting use-cases and business cases aligned with business strategy; prototyping, testing and implementing developed use-case; and finally monitoring and improving the implemented solution.

AI development comes with some challenges. First, a dataset needs to be created often by aggregating different but also relevant data sources and data types. Some examples of data sources are customers' activities and transactions often generated by interactions of customers on platforms and applications. Some data are also voluntarily inserted by users (e.g. date of birth) and employees (e.g. sales). For some AI projects, the challenge is to integrate all different data sources as they have different formats (structured or unstructured data). For other AI projects, a new data needs to be created by designing and implementing sensors or new data points.

The second challenge is related to training and building an algorithm (e.g. predictive model). The third challenge is associated with presenting and communicating AI outputs to AI users. Sometimes AI outputs are not meaningful or supportive for AI users, especially when the AI outputs aim to support AI users in decision-making process. The AI outputs should be visualized and presented in a practical way to encourage AI users to adopt and use it. The last challenge is related to performance assessment and improvement of the model to ensure the AI solution meets business KPIs.

How the Deloitte Risk Advisory team is responding

Digital technologies and innovation entail ethical risks and uncertainty which require new ethical principles and frameworks⁵. Sam and Frank believed that innovation needs to be at the intersection of ethical, sustainable and social goals. For any project, they put users/citizens/customers/employees at the center of their design.

As innovating and at the same time managing risk, dealing with uncertainty and remaining compliance put many companies in difficulties, Sam and Frank engage in developing two main services to support the client firms.

The first one is innovative products to support client firms to develop ethical AI and achieving compliance. Such innovative products (e.g. frameworks and tools) aim to help developing teams composed of people with diverse backgrounds (such as developers, computer scientists, designers, legal and privacy experts) – develop AI ethically. For instance, Sam and Frank together with banks and other experts have created a checklist for AI projects. The checklist supports the team to be compliant with items such as governance, transparency, security, privacy, robustness, and explainability to name a few. In another example, Sam and Frank collaborate with other teams to develop a service to measure technical key performance indicators (KPIs) (e.g. accuracy), and ethical KPIs (e.g. fairness of AI system, privacy and security). While innovation comes with uncertainty, it is often difficult to ensure that new projects have a positive impact on business. Having such KPIs allows different functions to measure and align project objectives with business objectives. This makes life easier not only for developing teams but also for business owners and risk analysts to monitor better KPIs during the developing phase.

The second service is to support client firms to use AI systems in compliance with rules and regulations. This is a sort of end-to-end idea or product based on AI which is developed and then implemented for client companies. Compliance with regulations is the main concern for Sam and Frank, especially after AI Act. However, the degree of compliance can be different from one project to another one due to sector, purpose and use of AI and etc. Before starting a new AI project for a client firm, Sam and Frank ask themselves two questions: 1) what is the level of risk according to AI Act: is the use-case of AI classified as low-risk or high-risk?; 2) whether the aim of the project is concept development (i.e. proof of concept) or production?

While the first question determines the degree of compliance needed for AI projects, the second question is associated with the innovation approach (e.g. exploration-orientation vs exploitation-orientation).

5. See report by Deloitte on Ethics and Trust in Technology <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-tte-annual-report.pdf>.

For AI projects categorized as having high-level risks according to AI Act and in the production phase (exploitation-orientation), there is a need to verify whether the use case is prohibited by the Act or not. If the use case is not prohibited by regulatory bodies, the high-risk AI project is subject to stringent regulations. Numerous legal requirements need to be taken into consideration to ensure that AI is developed ethically and compliant.

For AI projects with high risk (not prohibited) and at the concept development phase (exploration-orientation), the innovation approach needs to be iterative. Such projects often are developed in the regulatory sandbox to see whether the use case makes sense for business; what are the main benefits and challenges. When the business benefits are convincing, an iterative approach is needed to develop a business case while addressing the challenges and ethical issues.

For AI projects with low risk and in the production phase, some controls are needed to ensure transparency (e.g. transparency about GDPR) and mitigate risks. For AI projects with low risk and in the concept development phase, there is less concern about compliance and the focus is on the discovery of new use cases and ideas.

Importance of Digital resources and infrastructure for Deloitte Risk Advisory

Digital resources and infrastructure are crucial in developing AI projects. Often other actors own those digital resources and infrastructure. Partnerships and interactions with actors (providing digital infrastructures) help the development team access resources to test or train their AI system for instance. Some AI projects can also use open-source platforms like GitHub for transparency reasons.

Partnering with different actors allows exploring emerging technologies to discover new business processes/products and exploiting the existing technologies to reduce cost, and enhance the efficiency and effectiveness of business processes.

Having a network of diverse partners improved the ability to access knowledge, resources and capabilities to develop and implement faster AI systems.

Conclusion

Sam and Frank knew there is a conflicting tension between innovation and compliance with the emerging regulations. In the last projects, Sam and Frank were successful in supporting client firms in their AI projects and learned how to respond to the regulations, however, they both knew that the new regulations come into force, and they need to understand how the regulations influence their activities and how best they can support client firms. One key point is regarding the regulatory landscape. There are many regulations that come into force at different levels (e.g. sector-specific regulations or regional regulations). Some efforts might need to integrate such fragmented policies, rules and regulations to ensure compliance. However, not all of the regulations must consider as constraining but rather provides guidelines.

Another challenge that Sam and Frank saw was related to data sharing. Data sharing within an organization and/or inter-organizations enables data-driven innovation. This creates a dilemma for companies as a tension between data sharing and sustaining their competitive advantages with different pros and cons. Thus, one important aspect is collaborating on one activity and competing in another with a diverse set of actors. This underlines another question when, how and with whom to collaborate and compete.

Discussion Questions

- I. Why should firms adopt AI?
- II. What are the main characteristics of AI and its implications for firms?
- III. What are the main ethical issues and risks associated with AI?
- IV. Explain the role of regulations in the development of digital innovation?
- V. How firms can develop and use AI while ensuring it is compliant with evolving regulations?
- VI. How firms can respond to changing regulations?
- VII. In your opinion, how does the regulatory landscape influence collaboration and competition among actors?
- VIII. What are the other challenges in regulating digital innovation?

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