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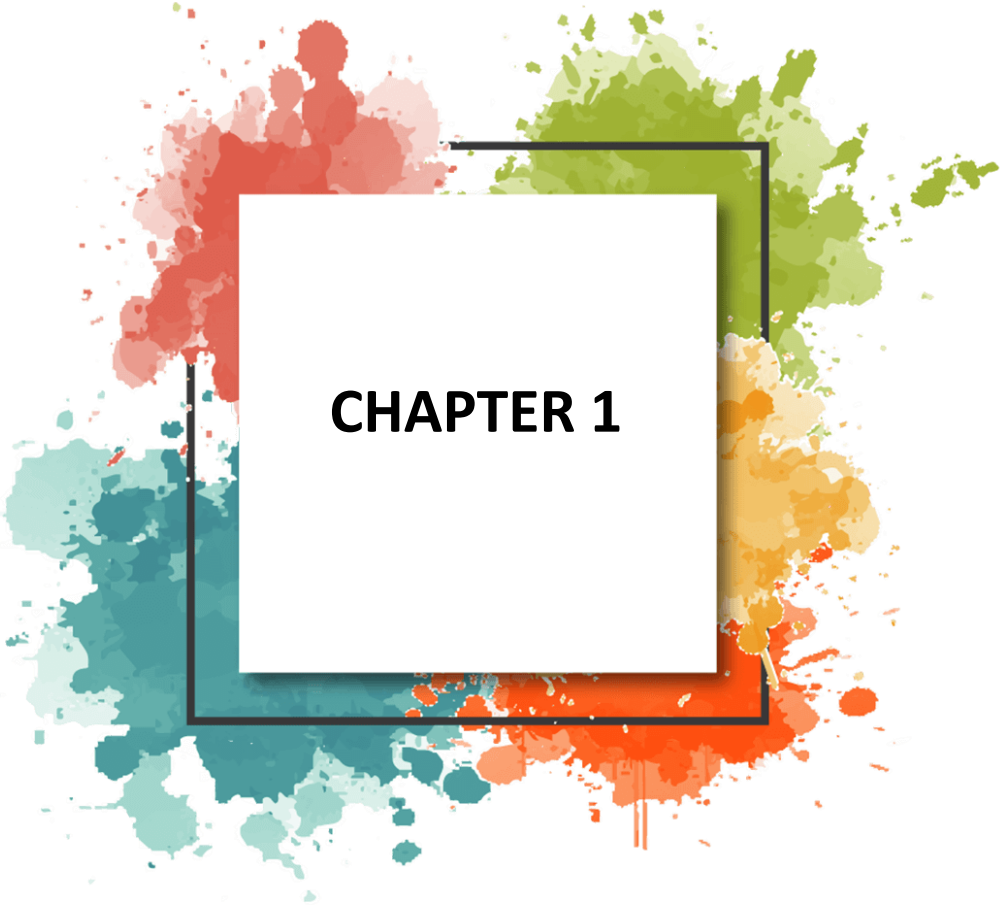
CHAPTER 1

Systemic Risk in Digitalised Banking: The Possibility of A Cyber-Financial Crisis

Meltem Keskin[1]

Introduction

While digitalisation in the banking sector offers significant benefits such as reduced costs, increased financial inclusion, and faster service delivery, it also brings new and complex types of risks to the financial system. The widespread adoption of artificial intelligence, cloud computing, big data analytics, open banking infrastructures, and financial technologies has fundamentally transformed the operational structure of banks; this transformation has significantly increased the level of interdependence and integration within the financial system. Unlike previous technological innovations, the current digitalisation process has a deeper impact in terms of both speed and scope, making cyber risks a central element of financial stability.

Digital banking applications and real-time payment systems accelerate financial intermediation, reducing transaction costs and expanding access. However, the increasing reliance of banks' operational processes on digital infrastructures and third-party technology providers transforms cyber risks from a purely corporate operational problem into a systemic threat. Unlike traditional credit, market, and liquidity risks, cyber risks have the potential to create sudden, simultaneous, and large-scale impacts without being bound by physical boundaries. Recent data breaches, ransomware attacks, and disruptions in payment systems demonstrate that cyber incidents not only lead to micro-level financial losses but can also transform into macro-financial instability through channels such as erosion of customer trust, deposit withdrawals, and liquidity crunch. In this context, the main objective of this study is to evaluate the possibility of a "cyber financial crisis," which is increasingly discussed in the literature, within a conceptual and analytical framework by examining the potential for cyber risks to spread throughout the financial system in the digitalised banking system. First, the concept of systemic risk is examined from the perspective of the digital finance ecosystem, differentiating it from traditional financial crisis approaches. Then, the relationship between major types of cyberattacks, such as data breaches, denial-of-service attacks, ransomware, and sabotage of critical infrastructure, and high digital integration among banks is

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analysed. It is argued that concentration in the banking system, dependence on digital platforms, and excessive reliance on third-party technology providers facilitate the creation of systemic risks through the chain reaction of cyber shocks.

International regulatory bodies are also drawing attention to the systemic dimension of cyber risks. The Bank for International Settlements (BIS) and the Financial Stability Board (FSB) emphasise that increasing digital dependence in the financial system is creating a new crisis dynamic where a single cyber incident can simultaneously affect numerous financial institutions. However, most existing regulatory frameworks still treat cyber risks as operational risks, failing to adequately internalise their macro-financial impacts. Furthermore, the lack of coordination between public authorities and the private sector makes effective management of cyber crises difficult.

This study argues that cyber risks not only lead to operational losses at the micro level; they can also spread throughout the system via trust, liquidity, and financial networks, causing financial instability. In this context, the article demonstrates that cyber risks should be addressed from a systemic risk perspective and proposes expanding macroprudential policy tools to include the cyber resilience dimension. The study offers three key contributions to the literature: First, it redefines the concept of systemic risk within the context of digital financial architecture. Second, it classifies the channels of cyber risk propagation within a holistic analytical framework. Third, it reveals the limitations of current regulatory approaches and offers policy implications for internationally harmonised and proactive cyber resilience policies.

Literature Review

The concept of systemic risk has long been central to the economics and finance literature, aiming to explain the dynamics of financial crises. Early studies primarily addressed systemic risk within the context of balance sheet vulnerabilities, excessive leverage, and liquidity mismatches in the banking sector (Minsky, 1986; Allen & Gale, 2000). These studies demonstrated that interconnectedness among financial institutions accelerated the spread of shocks during crisis periods. Following the 2008 Global Financial Crisis, the literature began to emphasise that systemic risk stems not only from the size of individual institutions but also from financial network structures and interdependencies. In particular, the financial network analysis approach shows that interconnectedness between banks and financial markets is one of the key factors determining the depth of crises (Battiston et al., 2012; Acemoglu, Daron & Ozdaglar, 2015). In this context, the understanding that "it cannot sink because it is too big" has been replaced by the perspective that "it cannot sink because it is too interconnected."

With the digitalisation of financial systems, the systemic risk literature has entered a new phase. Digital banking, the fintech ecosystem, and platform-based financial services have accelerated financial intermediation while increasing the system's dependence on technological infrastructures (Vives, 2019). This transformation has necessitated a reassessment of the impact of operational risks on financial stability. In particular, shared software systems, cloud computing, and third-party service providers stand out as new areas of concentration for systemic risk (EBA, 2019).

In recent years, studies on the impact of cyber risks on financial stability have increased in the literature. Kopp, Kaffenberger, and Wilson (2017) argue that cyber risks lead to inefficient risk sharing in the financial system by creating market failures. Gai, Kapadia, and Millard (2018), on the other hand, analyse the potential for cyber attacks to spread through financial networks, demonstrating that cyber risks can be a trigger for systemic crises. These studies reveal that cyber risks are not merely a technical security problem, but a macro-financial stability issue. Regulatory literature is also developing in parallel with this transformation. Reports published by the BIS and FSB emphasise that cyber resilience should become an integral part of financial stability policies (BIS, 2021; FSB, 2021). However, it is observed that empirical studies on measuring the systemic impacts of cyber risks are limited in the academic literature, and the conceptual framework is not yet fully mature.

This study addresses this gap in the existing literature by examining the capacity of cyber risks to generate systemic risks in the digitalised banking system from a holistic perspective, and opens up a theoretical discussion on the concept of "cyber financial crisis." Existing studies mostly focus on operational losses at the micro level or on individual institutions; studies that comprehensively address how cyber risks can evolve into systemic crisis dynamics through financial networks and digital infrastructures remain limited.

Systemic Risk and Digital Financial Architecture

Systemic risk is defined as a shock originating in one part of the financial system that threatens the entire system through interconnections and spillover mechanisms. This concept has been central to the financial stability literature, particularly since the 2008 Global Financial Crisis, and has been addressed in the context of bank failures, liquidity freezes, and simultaneous collapses in asset prices (Acharya, 2009). In the traditional approach, systemic risk has largely been analysed through the balance sheet structures, leverage levels, and market behaviours of financial institutions. However, the digitalisation process has fundamentally transformed the architecture of the financial system, expanding the sources and spread channels of systemic risk. Digital financial architecture creates a multi-layered structure with a high degree of integration and

interdependence among banks, payment systems, fintech companies, cloud service providers, and data infrastructures. Within this structure, a cyber-related disruption has the potential to spread not through physical assets or balance sheets, but directly through digital networks (Borio, 2020).

One of the most prominent features of digital financial architecture is the performance of financial transactions on concentrated and centralised digital infrastructures. Real-time payment systems and open banking applications, in particular, accelerate the flow of data and funds between financial institutions, while simultaneously increasing the system's vulnerability. In this context, shared software platforms and third-party technology providers are becoming new focal points of systemic risk (Carstens, 2021). The literature addresses the effects of digitalisation on systemic risk in two ways. On the one hand, digital technologies increase market efficiency by reducing information asymmetry and improving risk management processes. On the other hand, technological homogenization, algorithmic decision-making mechanisms, and network effects can cause financial shocks to spread simultaneously and rapidly (Gennaioli, Shleifer & Vishny, 2018). This situation reveals that systemic risk stems not only from magnitude but also from interconnectedness. Cyber risks, in particular, stand out as a triggering factor for systemic risk in digital financial architecture. High digital integration between banks allows a single cyber incident to affect multiple financial institutions simultaneously; this transforms the traditional "too big to fail" approach into a "too interconnected to fail" understanding (Battiston et al., 2016). Therefore, in the digital age, systemic risk should be analysed not only through financial magnitudes but also through digital network structures. While digital financial architecture holds the potential to increase the resilience of the financial system, it also generates new and inadequately measured sources of systemic risk. Therefore, systemic risk analyses need to be restructured to include the role of digital infrastructures and levels of cyber dependency.

Systemic Spread Channels of Cyber Risks

Cyber risks are becoming increasingly important in digitised financial systems and are creating new systemic vulnerabilities in terms of financial stability. Unlike traditional financial risks, cyber risks can create sudden, simultaneous, and cross-border effects without being bound by physical boundaries. These characteristics increase the potential for cyber incidents to evolve from micro-level operational problems to macro-financial crises (Bouveret, 2018).

Operational Disruptions and Infrastructure Dependence: Cyberattacks can directly target the core operational processes of banks and financial institutions. Disruptions in payment systems, core banking software, and data centres can lead to the cessation or delay of financial transactions, disrupting market operations. Attacks, particularly those targeting real-time gross settlement (RTGS) systems,

can disrupt the liquidity flow of the financial system, creating systemic stress (Duffie & Younger, 2019). The widespread use of shared infrastructure in digital financial architecture is one of the key factors strengthening the systemic impact of cyber risks. While cloud computing services and outsourced data centres provide economies of scale, a single cyber incident can cause numerous financial institutions to be affected simultaneously (EBA, 2019).

Trust Channel and Liquidity Diffusion Mechanism: Trust plays a central role in the functioning of the financial system. Cyber incidents resulting in customer data breaches or service disruptions can undermine trust in financial institutions, triggering deposit withdrawals. In the digital banking environment, this process occurs much faster than in traditional banking, leading to sudden liquidity pressures (Gorton & Metrick, 2012). In this context, cyber risks become a trigger for liquidity risk and create stress in interbank funding markets. Such shocks, spreading through the trust channel, can permeate the entire financial system via interbank markets (IMF, 2022).

Financial Networks and Contagion Effect: Financial network structures play a critical role in the systemic spread of cyber risks. Intensive digital connections between banks, payment systems, and financial markets create fertile ground for the rapid spread of cyber shocks. Network theory literature suggests that high levels of connectivity, rather than increasing risk sharing during crises, can actually amplify the contagion effect (Acemoglu et al., 2015). Algorithmic trading and automated risk management systems, in particular, are vulnerable to cyber-related erroneous data flows or system failures. Such situations can lead to sudden and simultaneous disruptions in market pricing, deepening systemic instability (Danielsson et al., 2018).

International Spread and Cross-Border Impacts: The global integration of financial markets is increasing the transnational impact of cyber risks. Multinational banks, global payment systems, and international data flows mean that cyber incidents can cause financial instability not only at the national but also at the global level. This situation links cyber risks to the perspective of international finance and balance of payments (BIS, 2021). The systemic propagation channels of cyber risks are shaped through operational infrastructures, trust and liquidity mechanisms, financial network structures, and international connections. This multi-dimensional structure makes it insufficient to address cyber risks with traditional risk management frameworks and demonstrates that a systemic risk perspective has become necessary.

Regulatory Framework and Policy Debates

The transformative effects of digitalisation on the financial system have reopened the debate on the adequacy of the existing regulatory and supervisory

framework. Traditional financial regulations are built on a structure that primarily addresses credit, market, and liquidity risks, mostly considering cyber risks under the heading of operational risk. However, in the digital banking era, the scale, speed of spread, and potential for simultaneous impact of cyber risks demonstrate the inadequacy of this approach (Borio, 2020). In recent years, international regulatory bodies have begun to draw attention to the systemic importance of cyber risks for financial stability. Reports published by the Bank for International Settlements (BIS) and the Financial Stability Board (FSB) emphasise that cyber resilience is a critical element for the security of not only individual financial institutions but the entire financial system (BIS, 2021; FSB, 2021). In this context, the concept of "operational resilience" has begun to be placed at the centre of financial regulations. However, current regulatory approaches largely rely on a microprudential perspective. Banks' information technology infrastructures, data security, and internal control systems are audited on an individual institutional basis; however, the potential for cyber risks to spread to the systemic level through inter-institutional interactions is not sufficiently considered (Kahn & Roberds, 2009). Yet, in digital financial architecture, shared infrastructures and third-party service providers create new nodal points where risk is concentrated. This situation highlights the need to include cyber risks in the macroprudential policy framework. In the literature, policy recommendations such as adding cyber scenarios to financial stress tests, establishing mandatory cyber resilience standards for systemically important financial infrastructures, and strengthening data sharing mechanisms stand out (Bouveret et al., 2022). Furthermore, the lack of a standard methodology for measuring cyber risks complicates the decision-making processes of policymakers.

The global nature of the digital financial system necessitates regulatory harmonisation and international cooperation. Cyberattacks transcend borders and can limit the effectiveness of national regulations. In this context, harmonising international standards and increasing information sharing among regulatory bodies are critical in mitigating the risk of cyber financial crises (IMF, 2022). Cyber resilience should be defined as a macroprudential policy objective at the same level as capital adequacy and liquidity regulations; a ‘critical because it is highly interconnected’ approach should be adopted for systemically important digital financial infrastructures. Otherwise, regulatory gaps and differing country practices create new vulnerabilities that can deepen systemic risks. Regulatory framework and policy discussions show that the impact of cyber risks on financial stability must be addressed not only from a technical perspective but also from institutional and governance perspectives. In the digital banking era, an effective financial stability policy should make cyber resilience an integral element of macroprudential regulations.

Conclusion

This study examines the impact of cyber risks on financial stability in the digitalised banking system from a systemic risk perspective, conceptually exploring the increasingly important possibility of a "cyber financial crisis" in the literature. Despite the speed, efficiency, and inclusiveness advantages offered by digital banking, open banking, and financial technologies, it has been shown that the financial system's dependence on digital infrastructures and third-party technology providers has increased. This dependence strengthens the potential for cyber incidents to not only result in operational losses but also generate system-wide shocks. In this study, the concept of systemic risk is re-examined within the context of digital financial architecture, moving beyond traditional balance sheet-based approaches. In particular, high interbank digital integration, shared infrastructure use, and the complexity of financial network structures have been identified as key factors increasing the contagion effect of cyber risks. This demonstrates that in the digital age, systemic risk is shaped not only by "magnitude" but also by "connectivity."

Analysis of the systemic propagation channels of cyber risks has revealed that mechanisms such as erosion of trust, liquidity pressures, and disruptions in payment systems can deepen financial instability. The acceleration of customer behaviour in the digital banking environment can cause such shocks to spread more quickly and on a wider scale compared to traditional crises. Therefore, cyber risks are considered a new trigger that transforms the nature of financial crisis dynamics. From a regulatory framework perspective, the study emphasises that current microprudential approaches are insufficient in capturing the systemic dimension of cyber risks. Integrating cyber resilience with macroprudential policy tools, including cyber scenarios in stress tests, and developing common standards for systemically important financial infrastructures are critical for maintaining financial stability. Furthermore, the transnational nature of cyber risks necessitates strengthening international regulatory cooperation. Finally, this study reveals that the threats posed by cyber risks to the financial system have not yet been fully measured, and the empirical literature remains limited. Future research should focus on the systematic collection of cyber incident data, its integration with financial network models, and the quantitative analysis of macro-financial impacts. In this context, the study aims to contribute to discussions on financial stability in the digital banking age at both theoretical and political levels. In this respect, cyber risks broaden the scope of financial stability discussions by demonstrating that financial crises in the digital age can have not only economic but also technological origins.

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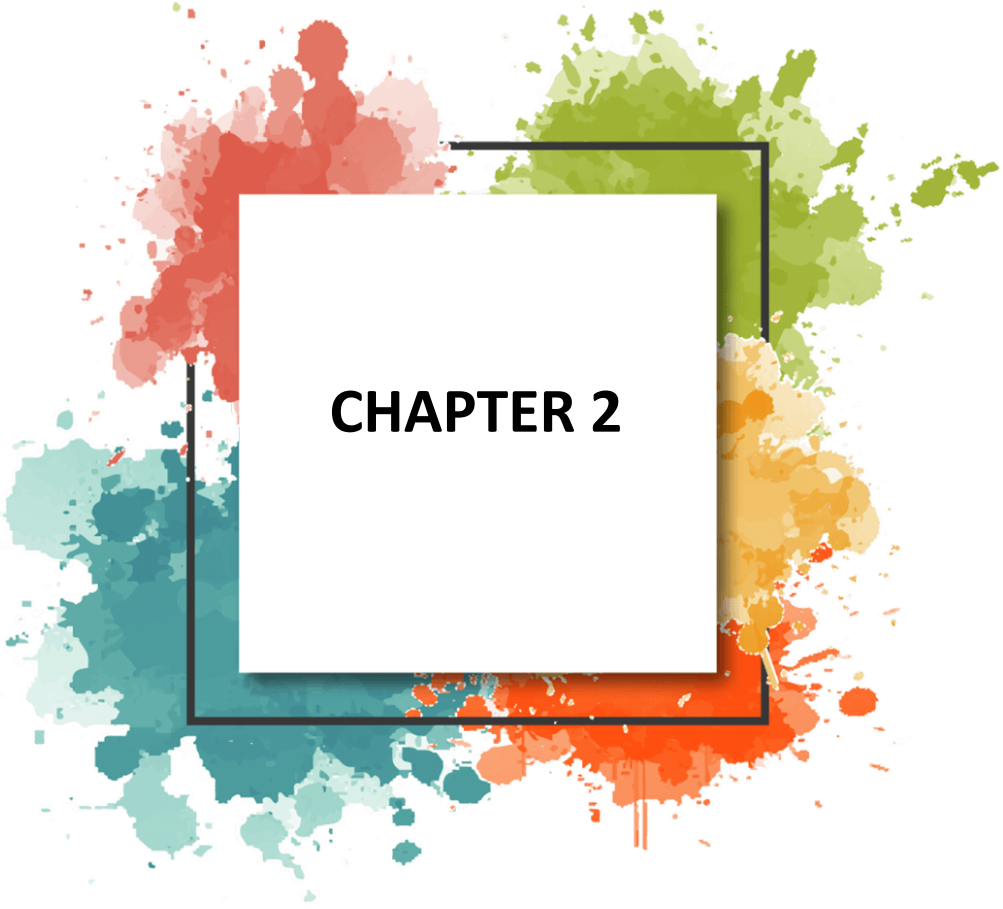
CHAPTER 2

Rethinking Biodiversity Conservation Priorities:A Geographical and Governance Perspective

Fatih Sünbül[1]

1. Introduction

Biodiversity broadly refers to the variety of life and the complex web of relationships that connects organisms from the smallest microorganisms to the largest plants and animals. Beyond a simple inventory of species, the concept encompasses multiple, interlinked levels of biological variation. In biological sciences, biodiversity is commonly framed across genetic diversity, species diversity, and ecosystem diversity, highlighting how variation is distributed across space and time. From ecological and biogeographical perspectives, biodiversity is also understood as a dynamic and historically produced system, shaped by long-term Earth processes and increasingly reorganised by contemporary anthropogenic pressures, including global warming and human-driven climate change. Despite differences in disciplinary emphasis, a widely used and comprehensive reference point is the definition adopted in the Convention on Biological Diversity, which conceptualises biodiversity as variation among living organisms across terrestrial, marine, and other aquatic ecosystems, including the ecological complexes of which they are part.

Biodiversity is not a static attribute of nature; it is the outcome of deep time and repeated phases of diversification, stability, and disruption. Evidence from palaeontology and molecular biology suggests that the origin of life extends back to the Precambrian, with major evolutionary transitions occurring unevenly through geological history. The emergence of multicellularity, followed by the diversification of complex animals, represents a critical turning point, while the Cambrian period is often described as a phase during which many major animal groups become visible in the fossil record. Over subsequent eras, biodiversity expanded through a combination of radiations and reorganisations, punctuated by mass extinctions that reshaped evolutionary trajectories. This long-term perspective underscores that biodiversity patterns reflect both gradual change and abrupt discontinuities, and that present-day diversity is embedded in a complex history of Earth-life coevolution.

In the contemporary era, biodiversity is widely recognised as foundational to ecosystem functioning and to the benefits humans derive from nature. A major

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share of ecosystem services,ranging from material outputs such as food, fibre, timber, freshwater, and bio-resources, to regulating functions such as climate regulation, water regulation, erosion control, pollination, and disease regulation,depends on the diversity of organisms and their interactions. Cultural and non-material contributions, including aesthetic experience, recreation, ecotourism, and the maintenance of cultural meanings attached to landscapes, are also intertwined with biodiversity. Moreover, biodiversity contributes to resilience: diverse systems often maintain functions under disturbance because ecological roles can be distributed across multiple species, enabling partial compensation when some populations decline. In this sense, biodiversity supports not only productivity and stability, but also the adaptive capacity of ecosystems and the societies that depend on them.

These benefits are not limited to ecological integrity; they extend to economic activity, public health, and long-term development pathways. Nature-based production and ecosystem services underpin significant sectors of the global economy, and many livelihoods depend directly on forests, waters, soils, and biodiversity-rich landscapes. Biodiversity is also closely connected to health and medicine, as biological organisms provide biochemical diversity that supports pharmacological discovery and medical innovation, while healthy ecosystems contribute to clean air and water, and can reduce certain disease risks through balanced ecological interactions. At the same time, biodiversity is increasingly framed as a climate issue: diverse ecosystems play roles in climate mitigation through carbon sequestration and in climate adaptation by enhancing ecosystem resilience, protecting coastlines, and sustaining water and soil processes under changing conditions.

Yet the persistence of biodiversity and its benefits cannot be taken for granted. Current scientific discussions increasingly describe the present as a period marked by accelerated biodiversity loss driven by land-use change, habitat fragmentation, pollution, invasive species, overexploitation, and climate change. This context makes conservation prioritisation an urgent and contested task. Importantly, conservation priorities are not determined solely by ecological metrics; they are shaped by geographical conditions,such as spatial heterogeneity, connectivity, scale, and territorial dynamics,and by governance arrangements that structure decision-making, allocate authority, and mediate trade-offs between conservation and development. Building on this understanding, this chapter rethinks biodiversity conservation priorities through a geographical and governance perspective, positioning prioritisation as a spatially embedded and institutionally mediated process rather than a purely technical exercise. In doing so, it provides a framework for connecting ecological value with the realities of territory, policy, and multi-actor governance in conservation planning.

2. Conceptual Foundations: What Is Biodiversity and Why Does It Matter?

2.1. Defining Biodiversity

Biodiversity is commonly understood as the breadth of life on Earth and the intricate network of relations that links organisms across scales, from microscopic forms to large-bodied species. Importantly, biodiversity cannot be reduced to a simple count of species. In biological sciences, it is typically conceptualised as variation at multiple, interconnected levels,genetic diversity, species diversity, and ecosystem diversity,emphasising that biological variation is patterned and expressed across both space and time. This multi-level framing also highlights that biodiversity is not merely a descriptive term; it provides a unifying lens for understanding how living systems are organised, how they function, and how they respond to disturbance.

Although disciplinary emphases differ, the most widely used policy-oriented definition is provided by the Convention on Biological Diversity (CBD). This definition explicitly extends biodiversity to variation among living organisms within terrestrial, marine, and other aquatic ecosystems, including the ecological complexes of which they are part. By including genetic, species-level, and ecosystem-level dimensions in a single formulation, the CBD definition underscores that biodiversity is not limited to "what lives where," but also concerns the variety of interactions and ecological structures that sustain life. This framing is particularly influential because it links biodiversity to international commitments on conservation and sustainable use, and it positions biodiversity as a shared responsibility requiring coordinated governance.

Current global estimates of biodiversity also illustrate how unevenly biological knowledge and attention are distributed across taxa. While described species numbers are often summarised at the multi-million scale, many groups remain poorly documented, and some large domains of life,most notably fungi,are widely considered underrepresented in common biodiversity narratives. This matters for conservation: prioritisation decisions tend to be shaped by what is visible, measurable, and institutionally recognised, which may not always align with ecological importance.

2.2. Biodiversity Through Deep Time: An Evolving System

A geographical and governance perspective benefits from acknowledging that biodiversity is not a stable baseline; it is the product of long-term Earth–life coevolution. Knowledge of these large-scale processes draws primarily from fossil records and phylogenetic reconstructions. Synthesised geological chronologies show that biodiversity has expanded through uneven and episodic pathways rather than through constant, linear accumulation. Key evolutionary

transitions,including the emergence of multicellular organisms and the diversification of complex animal life,occurred at distinct points in geological time, and were shaped by shifting environmental conditions.

The historical dynamics of biodiversity are often characterised by alternating phases of radiation, relative stability, and collapse, with mass extinctions functioning as major reorganising events. The Cambrian is frequently discussed as a period in which many major animal groups become more clearly represented in the fossil record, while subsequent eras include both expansions of life into new environments (including the colonisation of land by plants and arthropods) and major contraction events. These patterns highlight two implications relevant to conservation: (i) biodiversity is historically contingent, shaped by environmental change and ecological opportunity; and (ii) abrupt disruptions can restructure ecological systems faster than recovery can occur.

Table 1 offers a concise overview of this deep-time trajectory by linking major geological periods to key biological and ecological transitions, including the origin of life, the expansion of vascular plants, diversification of vertebrate lineages, and the emergence of modern humans.

Table 1: Geological periods and major associated events.

Era/Interval	Period	Approx. Mya*	Major Event(S)
Precambrian	Precambrian	4000	Origin of life; earliest multicellular organisms
Paleozoic	Cambrian	550	Appearance of major animal phyla in the fossil record; first vertebrates (including jawless fishes)
	Ordovician	500	Emergence of jawed fishes
	Silurian	440	Colonisation of land by plants and arthropods
	Devonian	410	Diversification of teleosts (bony fishes); first amphibians and insects
	Carboniferous	360	Extensive forests of vascular plants; origins of reptiles; dominance of amphibians
	Permian	290	Major extinction among marine invertebrates; origins of mammal-like reptiles and “modern” insects
Mesozoic	Triassic	250	Origins and diversification of archosaurs; origins of mammals; dominant seed plants

	Jurassic	210	Dominance of archosaurs and gymnosperms; origins of birds
	Cretaceous	140	Rise of angiosperms; diversification of archosaurs and many invertebrate groups; end-Cretaceous extinction
Cenozoic	Tertiary	65	Diversification of mammals, birds, pollinating insects, and angiosperms; late Tertiary/early Quaternary peak in biodiversity
	Quaternary	1.8	Origins and expansion of humans

*MYA: million years ago (approximate values, as presented in the source synthesis).**Source:** Adapted from Gaston and Spicer (2004).

2.3. Why Biodiversity Matters: Ecosystem Services, Resilience, and Human Well-being

Biodiversity is central to ecosystem functioning and, by extension, to the conditions that sustain human societies. Its importance is multi-dimensional: it supports material production, regulates environmental processes, contributes to cultural and aesthetic values, underpins health and medical innovation, and enhances the capacity of ecosystems to persist and recover under stress. In many cases, biodiversity's contribution is not simply additive; it is structural,biological diversity shapes the architecture of ecosystems, the stability of interactions, and the reliability of ecological processes over time.

A widely used way to articulate this relationship is through ecosystem services, understood as the set of processes and functions through which ecosystems generate benefits for people. Ecosystem services include tangible outputs (such as food, freshwater, timber, fibre, and bio-resources) as well as less visible,but equally essential,functions such as nutrient cycling, soil formation, water regulation, pollination, disease regulation, and climate regulation. From a conceptual standpoint, the key point is that many services depend on diversity in organisms and ecological roles: when functional roles are distributed across multiple species, ecosystems may maintain performance even if some components decline.

Following the Millennium Ecosystem Assessment typology, ecosystem services are often grouped into four broad categories: provisioning, regulating, cultural, and supporting services. Table 2 summarises illustrative examples under each category, ranging from provisioning services (food and freshwater) to regulating services (climate and erosion regulation), cultural services (recreation, ecotourism, spiritual values), and supporting services (primary production, nutrient cycling, and water cycling).

Table 2: Ecosystem service categories and examples.

Service category	Examples of services
Provisioning services	Food; biological raw materials (e.g., fibre); genetic resources; biochemicals and natural medicines; ornamental resources; freshwater
Regulating services	Air quality regulation; climate regulation; water regulation; erosion control; pest and disease regulation; pollination
Cultural services	Cultural diversity/heritage values; spiritual and religious values; recreation and ecotourism; aesthetic values; knowledge systems; educational values
Supporting services	Soil formation; photosynthesis; primary production; nutrient cycling; water cycling

Source: Developed based on the Millennium Ecosystem Assessment (2005). (Service grouping also aligns with the classification logic reported in related syntheses, e.g., Daily, 1997; Wallace, 2007).

Beyond services, biodiversity is widely linked to resilience and stability. Diverse ecosystems may be better able to absorb shocks,such as drought, extreme weather, biological invasions, or human disturbances,because different species and functional groups can respond differently to the same stressor. This "response diversity" can provide alternative pathways for sustaining ecosystem functions. In practical terms, biodiversity loss can therefore reduce not only the richness of life, but also the reliability of ecosystem processes that societies depend on.

Biodiversity's relevance also extends strongly into public health and medicine. Biological organisms contain an enormous diversity of biochemical compounds and genetic resources that support pharmacological discovery and biomedical innovation. At the same time, healthy ecosystems help maintain clean water and air, support soil fertility, and can influence disease dynamics through complex ecological balances. Economically, biodiversity and ecosystem services underpin major sectors and livelihoods, and global assessments increasingly highlight that substantial portions of economic activity rely on nature-dependent systems.

Finally, biodiversity is increasingly recognised as a climate-related issue. Ecosystems such as forests, wetlands, peatlands, and coastal habitats can contribute to climate mitigation through carbon storage and sequestration, while biodiversity can support climate adaptation by stabilising soils, regulating water, buffering coastal impacts, and enhancing the overall resilience of socio-ecological systems. Taken together, these arguments underscore that biodiversity conservation is not solely an ecological objective; it is also a development, governance, and territorial planning concern.

3. Biodiversity Degradation: Drivers, Mechanisms, and Multi-Scalar Consequences

Biodiversity loss is not a new phenomenon in Earth history. Extinction, turnover, and reorganisation have repeatedly occurred through geological time, and such episodes are often discussed as part of "background" evolutionary dynamics punctuated by rarer crises (Williamson, 1989; Raup, 1994; Delord, 2007; Barbault, 2013). What differentiates the current period is not the existence of loss itself, but the dominant causal architecture: contemporary biodiversity decline is strongly associated with human-driven pressures that operate simultaneously across local, regional, and global scales. In this sense, the present biodiversity crisis is frequently framed as a socio-ecological problem, where biophysical systems are reorganised by the cumulative impacts of land-use change, industrialisation, and accelerating climate change, alongside governance, consumption, and technology regimes that shape how pressures are produced and distributed.

3.1. From Localised Human Impacts to a Planetary Biodiversity Crisis

Early human societies interacted with ecosystems in ways that were largely constrained by low population densities and limited technological reach. Under these conditions, anthropogenic pressures tended to remain spatially concentrated and were often partially offset by ecological responses such as dispersal and migration, allowing many populations to persist despite disturbance (Lorenzen et al., 2011; Palombo, 2021). Yet even in these earlier periods, human influence could be consequential. Quaternary megafaunal declines, for instance, are widely interpreted as arising from a combination of climatic shifts and intensified hunting pressures, illustrating that human activity can become a critical driver when ecological thresholds are crossed (Sandom et al., 2014; Smith et al., 2019; Brown et al., 2020).

Over time, the scale of transformation expanded with agriculture, settlement growth, and the institutionalisation of resource extraction. Converting natural habitats into cropland and pasture, altering hydrological systems through storage and diversion, and expanding timber harvesting for construction and energy progressively reshaped landscapes and reduced habitat continuity (Cardinale et al., 2012; Newbold et al., 2015; Goudie, 2018). However, many syntheses identify the Industrial Revolution as a major historical inflection point because it intensified both the rate and spatial reach of environmental change through mechanised production, urban expansion, and the rapid growth of transport networks (Kumar, 2007; Pongsiri, 2009; Leigh et al., 2019). Industrial-era demand for resources accelerated deforestation and land conversion, while atmospheric and chemical pollution altered soils, waters, and air quality in ways that propagate through food webs and ecosystem processes (Sieferle, 2001;

Falcucci et al., 2007; Haines, 2009; Barker & Tingey, 2012; Maiti & Chowdhury, 2013). At the same time, global mobility and trade increased the probability of species translocations, supporting biological invasions and triggering new forms of biotic homogenisation (Hulme, 2009).

In the contemporary era, human influence is observable across virtually all environments,from the deep ocean to the upper atmosphere and from remote islands to polar regions,suggesting a shift from “local impacts” to a planetary footprint (Primm et al., 2006; Riggio et al., 2020). Consequently, biodiversity loss is increasingly interpreted as the combined outcome of multiple interacting drivers: habitat transformation and fragmentation, overexploitation, pollution, invasive species, and climate change, together with disruptions to broader biogeochemical cycles and genetic erosion within managed systems (Diamond, 1989; Hens & Boon, 2003; Hayes & Hayes, 2013; Dasgupta & Levin, 2023).

3.2. Core Drivers of Biodiversity Degradation

Biodiversity degradation is driven by a set of interacting anthropogenic pressures that operate across spatial and temporal scales. Among these, habitat loss and fragmentation represent the most pervasive drivers reshaping biodiversity patterns worldwide (Shivanna, 2020). Fragmentation alters not only the amount of available habitat but also its spatial configuration, disrupting connectivity that underpins dispersal, gene flow, and long-term population viability (Wilcove et al., 1986; Fahrig, 2003). As habitats become smaller and more isolated, populations face heightened risks from demographic stochasticity, genetic drift, and environmental disturbances (Rybicki & Hanski, 2013). Edge effects further intensify degradation by modifying microclimatic conditions and disproportionately affecting interior-dependent species, leading to declines in richness and abundance in fragmented landscapes (Laurance et al., 2007; Haddad et al., 2015).

Deforestation remains a dominant pathway of habitat loss, primarily driven by agricultural expansion, settlement growth, and infrastructure development (Achard et al., 2014; Myers, 2023). Beyond direct habitat removal, forest loss disrupts carbon storage, hydrological regulation, and regional climate processes, producing particularly severe consequences in tropical regions where biodiversity is concentrated (Costa & Foley, 2000; Margulis, 2004).

Overexploitation, including hunting, fishing, logging, and unsustainable harvesting, continues to be a central driver of biodiversity loss across terrestrial and marine systems (Cullen et al., 2000; Abernethy et al., 2013). Industrialised fishing has restructured marine food webs and reduced populations of large-bodied, slow-reproducing species (Jackson et al., 2001; Pikitch, 2012), while selective pressure on high-value terrestrial species has elevated extinction risk in

many vertebrate groups (IUCN, 2008). Beyond population declines, overexploitation drives genetic erosion and alters life-history traits, reducing adaptive capacity and ecosystem resilience (Smith et al., 1991; Pinsky & Palumbi, 2014).

Pollution represents another major pathway of biodiversity degradation through chemical toxicity, altered nutrient regimes, and food-web contamination (Barker & Tingey, 2012; Sigmund et al., 2023). Agricultural chemicals negatively affect non-target organisms, including pollinators critical to ecosystem functioning and food security (Geiger et al., 2010; Brittain et al., 2010). Plastic pollution has emerged as a global threat, with microplastics now pervasive across ecosystems and trophic levels, altering organismal physiology and ecological interactions (Chae & An, 2018; Borrelle et al., 2020). Industrial and mining activities further contribute through heavy metal contamination, generating long-term ecological risks and slow recovery trajectories (Ogola et al., 2002; Rai, 2008).

Climate change increasingly acts as an overarching pressure that amplifies other drivers by altering temperature regimes, precipitation patterns, and disturbance dynamics (Wuebbles & Jain, 2001; Gustavsson et al., 2017). Species responses often involve range shifts, yet fragmented landscapes frequently constrain movement, producing mismatches between suitable climate space and accessible habitat (Lovett et al., 2009). In marine systems, ocean acidification and deoxygenation undermine calcifying organisms and reef structures, leading to system-level reorganisation of ecosystems and services (Pörtner et al., 2005; Diaz & Breitburg, 2009).

Finally, intensified global connectivity through transportation networks has accelerated biological invasions by facilitating species transfers across biogeographical boundaries (Hulme, 2008; Bailey, 2015). Invasions interact with habitat disturbance and climate change, often exacerbating biodiversity loss in already stressed systems. Biodiversity erosion is also evident within managed agricultural and livestock systems, where genetic simplification associated with high-yield varieties and standardised breeds reduces resilience to pests, disease, and climatic variability (Thrupp, 2000; Khoury et al., 2022). Together, these processes link biodiversity loss to broader questions of food security, economic dependence, and socio-ecological resilience.

3.3. Implications: Why Biodiversity Degradation Matters Beyond Conservation

The consequences of biodiversity loss extend beyond species counts. Degradation undermines ecosystem functioning and can destabilise the services that sustain human well-being, including regulation of water cycles, erosion

control, disease dynamics, and agricultural productivity (Cardinale et al., 2012; Pongsiri et al., 2009). For example, deforestation can alter hydrological regimes and intensify floods, erosion, and soil loss,costs that are often borne by societies over long time horizons (Zhang et al., 1996; Lawrence & Vandecar, 2015; Lal, 1996; Hu et al., 2021). Chemical contamination can disrupt decomposer communities and microbial processes that maintain soil fertility, demonstrating how even "invisible" components of biodiversity are integral to ecosystem stability (DeLorenzo et al., 2001; Hussain et al., 2009; Kalia & Gosal, 2011). As these examples indicate, biodiversity loss frequently manifests as a decline in system capacity,reduced resilience, reduced functional redundancy, and heightened sensitivity to disturbance.

At the same time, contemporary assessments highlight that many species remain undescribed or insufficiently studied, implying that extinctions can remove potential ecological functions and future benefits,medical, technological, or cultural,before they are even recognised (Wilson, 1989). This raises a governance challenge: conserving biodiversity is not only about protecting what is already known, but also about managing uncertainty, preventing irreversible loss, and maintaining option value for future generations.

3.4. Synthesis: The Logic of Cumulative Pressures

Overall, biodiversity degradation can be best understood as the cumulative outcome of interacting pressures rather than as a single-cause process. Habitat loss can increase invasion risk; pollution can weaken populations already stressed by fragmentation; climate change can magnify disturbances and shift ecological boundaries; and overexploitation can collapse food webs and accelerate system instability. These interactions suggest that effective conservation requires integrated strategies that address both proximate drivers (e.g., land conversion, harvesting, pollution) and underlying drivers (e.g., production and consumption systems, infrastructure pathways, governance capacity). In this chapter's geographical framing, the key point is that biodiversity loss is spatially differentiated: it concentrates in particular territories, corridors, frontiers, and socio-ecological contexts,making spatial prioritisation and governance design inseparable from the science of biodiversity itself.

This section demonstrates that biodiversity loss cannot be reduced to a single driver; rather, it emerges from cumulative and mutually reinforcing pressures,habitat destruction and fragmentation, overexploitation, pollution, invasive species, and climate change,whose intensities vary across space. These pressures alter ecosystem structure, functioning, and resilience, producing measurable deterioration in the state of biodiversity in terms of species richness, population viability, and ecosystem service provision. From this perspective, biodiversity conservation is not only about documenting losses; it requires a

systemic understanding of how responses, policy, governance, spatial planning, and on-the-ground interventions,can mitigate pressures and improve ecological conditions. The following section therefore adopts the Pressure-State-Response (PSR) framework to organise conservation strategies and to discuss how prioritisation tools (e.g., hotspots and other priority-area approaches) can guide effective allocation of limited resources.

4. Biodiversity Conservation Within a PSR (Pressure-State-Response) Framework

4.1. Conceptual Foundations of Biodiversity Conservation and the PSR Framework

Biodiversity conservation has become one of the defining agendas of the contemporary era, yet it refers to far more than the protection of species in isolation. It is fundamentally tied to safeguarding planetary health and the ecological integrity that sustains human well-being. From genetic diversity to ecosystems, biodiversity underpins critical ecosystem services, food security, climate regulation, clean water, soil fertility, and disease regulation, while also carrying intrinsic aesthetic, cultural, and spiritual values that distinguish Earth as a living planet. Losses in biodiversity therefore represent not only ecological decline but also a loss of the "identity" of the biosphere.

To analyse these dynamics systematically, the Pressure-State-Response (PSR) framework provides a structured lens linking human actions to ecological change and societal intervention. In this framework, pressures refer to anthropogenic drivers such as land-use change, habitat fragmentation, pollution, overharvesting, invasive species, and climate change. State captures the resulting condition of biodiversity and ecosystems, including shifts in species composition, population declines, habitat degradation, and reduced ecosystem functioning. Responses encompass the institutional, policy, and management actions designed to prevent, reduce, or reverse biodiversity loss. In biodiversity conservation, PSR is particularly useful because it highlights that effective strategies must simultaneously (i) reduce key pressures, (ii) monitor and diagnose ecological state, and (iii) strengthen responses through governance, planning, financing, and societal participation. These interlinked relationships between pressures, ecological states, and responses are synthesised in Figure 1, which presents the PSR framework as a simplified conceptual model for biodiversity conservation.

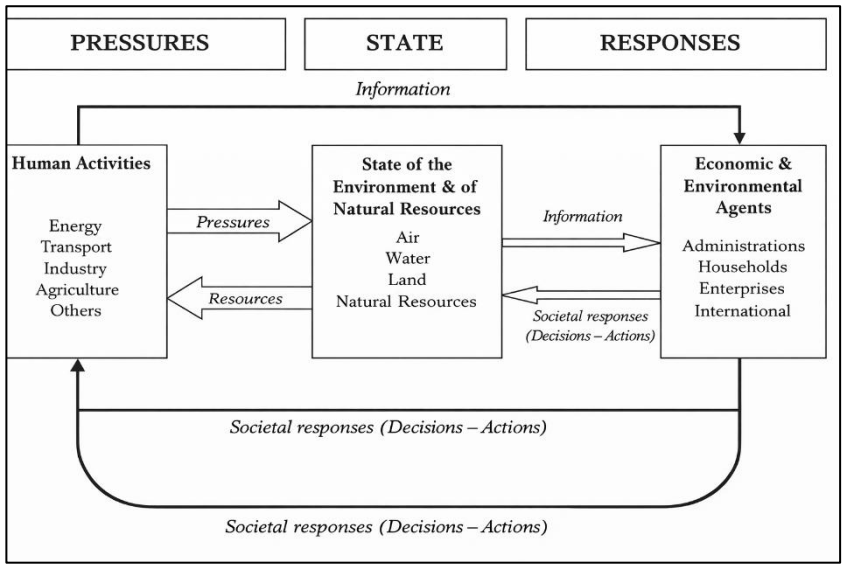

Figure 1. Conceptual representation of the Pressure–State–Response (PSR) framework for biodiversity conservation, illustrating the causal relationships between human activities, changes in environmental state, and societal responses, including feedback mechanisms that influence future pressures.

4.2. Global Responses: International Agreements and Strategic Frameworks

A cornerstone of global biodiversity governance is the Convention on Biological Diversity (CBD) adopted at the 1992 Earth Summit in Rio de Janeiro. The CBD formalised an expanded understanding of biodiversity, encompassing species, ecosystems, and genetic resourcesand emphasised its links to food security, public health, clean air and water, and sustainable livelihoods. The Convention is organised around three core objectives: (a) conservation of biological diversity, (b) sustainable use of its components, and (c) fair and equitable sharing of benefits arising from genetic resources.

Under the CBD umbrella, additional instruments have operationalised specific dimensions of conservation governance. The Cartagena Protocol on Biosafety addresses risks posed by living modified organisms, while the Nagoya Protocol develops rules for access and benefit-sharing related to genetic resources, aligning conservation with equity and incentives for sustainable use. Beyond CBD-related instruments, the UN Sustainable Development Goals (SDGs), particularly SDG 15 (Life on Land), frame biodiversity conservation as a global development priority, linking habitat protection, land degradation neutrality, and anti-desertification measures to broader socio-economic targets.

4.3. National and Local Responses: Legislation, Planning, and Institutional Capacity

International agreements gain practical effectiveness only when translated into national legislation, sectoral policies, and spatial planning instruments. At the national level, legislative and executive bodies shape conservation outcomes through protected species regulations, habitat protection, land-use planning, pollution control, and environmental impact assessment procedures. Where enforcement capacity is strong, legal frameworks can reduce illicit exploitation, regulate land conversion, and protect threatened taxa through restrictions and penalties.

However, the effectiveness of national responses varies widely. In contexts of limited institutional capacity, high economic dependency on natural resource extraction, or governance challenges, conservation laws may remain symbolic or poorly enforced. This gap often concentrates biodiversity loss in regions where pressures are intense and response mechanisms are weakest, underscoring the need for approaches that can prioritise interventions under real-world constraints.

4.4. Core Conservation Instruments: Protected Areas, Connectivity, and Restoration

Among the most visible response mechanisms are protected areas, including national parks, nature reserves, marine protected areas, and wildlife conservation zones. These areas aim to maintain ecological processes and provide refuge for threatened species and habitats by restricting damaging activities. The global expansion of protected areas demonstrates their central role in conservation strategies; nevertheless, protected areas can be undermined by insufficient resources, weak management, and in some cases downgrading or removal of protection status.

Because isolated protected areas may suffer from ecological and genetic fragmentation, connectivity measures, such as ecological corridors and landscape-scale networks, have become increasingly important. Connectivity enables movement, dispersal, and gene flow, strengthening resilience and reducing extinction risk for species requiring large territories or seasonal migration pathways. Examples such as the EU's Natura 2000 network illustrate how conservation can be operationalised through integrated spatial planning.

A complementary response is ecosystem restoration and rehabilitation, including reforestation, wetland recovery, and the repair of degraded habitats. Restoration not only improves biodiversity outcomes but also supports ecosystem services such as carbon sequestration, water regulation, and disaster risk reduction. In PSR terms, restoration works as a response targeting both ecological state improvement and the mitigation of long-term pressure legacies.

4.5. Priority Areas for Conservation: Biodiversity Hotspots and Targeted Investment

Given that conservation resources are inherently limited, biodiversity policy inevitably involves choices about where interventions can achieve the greatest ecological return. Biodiversity hotspots were developed as a prioritisation approach that directs attention to regions with exceptionally high species richness and endemism, coupled with acute vulnerability to human pressures. The central premise is pragmatic: under financial and institutional constraints, prioritisation reduces the risk of inefficient allocations and supports maximum conservation impact per unit investment.

Hotspot-based prioritisation aligns closely with the logic of conservation triage, which argues that interventions should focus on places where they can prevent the most significant and imminent losses. Empirical estimates have suggested that strategically protecting a relatively small number of globally important hotspot regions can secure disproportionate conservation benefits at comparatively manageable cost, thereby leaving room for additional investments in other conservation needs. At the same time, hotspot strategies are increasingly discussed in relation to development realities, including the expansion of agriculture, urban growth, and the livelihood dependence of local populations on natural resources. Compared to large-scale strict protection models that may generate socio-political tension and implementation challenges, targeted prioritisation can be more feasible and socially sustainable, provided that equity, participation, and local livelihood considerations are explicitly addressed.

Evidence from global conservation organisations and prioritisation initiatives further supports the credibility of hotspot-style approaches. These frameworks have expanded beyond single taxonomic groups by incorporating broader taxonomic coverage and, increasingly, ecosystem-level criteria. Nonetheless, hotspot approaches are not a standalone solution to global conservation targets. They should be understood as a critical instrument within a wider portfolio of responses that includes protected areas, connectivity planning, restoration, regulation, monitoring, and community-based governance.

4.6. Spatial Patterns of Biodiversity: Why Distribution Matters for Conservation Planning

Biodiversity is not distributed evenly across the Earth; it exhibits pronounced variation across latitude, longitude, continents, islands, oceans, and climatic zones. This unevenness reflects a complex mosaic shaped by Earth's physical structure, evolutionary history, and environmental gradients. Some regions host extraordinary richness and endemism, while others are comparatively species-poor; many areas fall between these extremes. Understanding such spatial

heterogeneity is essential for designing effective conservation strategies, because prioritisation, protected-area placement, and restoration targets depend on where biodiversity values and threats converge.

At the broadest scale, biodiversity shows strong latitudinal gradients linked to differences in solar energy input and the climatic regimes it produces. Tropical regions, where energy availability and climatic stability support high primary productivity, often sustain some of the world's richest ecosystems, including tropical rainforests. Moving toward higher latitudes, declining energy input and stronger seasonality shape different biomes and generally lower species richness, although temperate regions may still contain high endemism and unique biodiversity assemblages,particularly in Mediterranean-type ecosystems, which are recognised among global hotspot regions.

Beyond climate, topography and landforms create habitat heterogeneity and microclimatic variation, influencing species distributions, isolation, and endemism. Mountain systems generate altitudinal gradients that produce stacked ecological zones, often supporting high levels of endemism through isolation and niche differentiation. Valleys, basins, rivers, and lakes can function as corridors, barriers, or biodiversity-supporting resource concentrations. Similarly, islands and peninsulas can shape evolutionary dynamics via isolation, often producing exceptional endemism despite smaller overall species pools.

The distribution of land and sea, ocean currents, and marine depth gradients also strongly influence biodiversity patterns. Coastal zones, coral reefs, and productive shelf systems can concentrate marine biodiversity, while deep-sea environments impose constraints that reduce richness but support uniquely adapted taxa. Finally, lithology and tectonic processes contribute to biodiversity patterns through soil formation, nutrient availability, landscape evolution, and long-term biogeographic separation and reconnection.

In conservation terms, these spatial drivers matter because they shape both ecological value and vulnerability. Priority-area approaches, including hotspots, are most effective when paired with spatially explicit threat assessment and governance feasibility. Thus, biodiversity distribution should be treated not as descriptive background, but as a planning foundation that informs where pressures are strongest, where the ecological state is most fragile, and where responses can be most effective.

5. Biodiversity Conservation Prioritisation: Geographical and PSR-Based Implications

5.1. From Conservation Biology to Spatial Prioritisation: Insights from the Literature

Since the late twentieth century, biodiversity conservation has evolved from a predominantly species-centred concern into a spatially explicit and interdisciplinary field of inquiry. Early contributions in conservation biology highlighted the urgency of preventing species extinctions by integrating ecological theory with pragmatic management, emphasising habitat loss and fragmentation as central drivers of biodiversity decline. These foundational works established the conceptual basis for conservation as an applied science concerned with real-world decision-making.

A major shift occurred with the introduction of prioritisation concepts that explicitly recognised the scarcity of conservation resources. The biodiversity hotspot approach proposed that regions combining high endemism with intense anthropogenic pressure should receive priority attention, offering a cost-effective rationale for conservation investment (Myers, 1988). This line of research stimulated extensive debate and led to the development of alternative prioritisation strategies, including complementarity-based planning and systematic conservation planning frameworks. Together, these studies underline that conservation prioritisation is inherently spatial and context-dependent rather than reducible to a single ecological metric.

5.2. Integrating Human Pressures, Ecological State, and Responses

Parallel to the development of prioritisation theory, a substantial body of literature has focused on identifying the drivers of biodiversity loss and their spatial manifestations. Research on land-use change, climate stress, habitat fragmentation, and overexploitation has demonstrated that biodiversity decline typically results from cumulative and interacting pressures rather than isolated factors (Sala et al., 2000). These insights reinforced the need for integrative analytical frameworks capable of linking pressures to ecological outcomes and management responses.

Within this context, the Pressure-State-Response (PSR) framework gained prominence as a structuring tool for environmental and biodiversity assessment. Although initially developed for environmental reporting, PSR has been increasingly adapted to biodiversity applications, particularly in combination with multi-criteria decision analysis and spatial modelling (Dinh et al., 2020). By explicitly distinguishing between pressures, ecological state, and societal responses, the framework provides a transparent basis for identifying where conservation interventions are most urgently needed and where they are most likely to be effective.

5.3. Spatial Priorities, Governance, and Socio-Economic Constraints

A growing strand of the literature emphasises that conservation outcomes are strongly conditioned by governance arrangements and socio-economic contexts.

Studies on integrated conservation–development projects and community-based conservation demonstrate that biodiversity protection cannot be separated from human livelihoods, particularly in regions where local populations depend directly on natural resources (Wells & Brandon, 1992; Pretty & Smith, 2004). Conservation strategies that neglect these dimensions risk social conflict, reduced compliance, and long-term failure.

From a geographical perspective, this literature highlights the importance of spatial differentiation in conservation planning. High-biodiversity areas frequently coincide with regions facing development pressures, poverty, or limited institutional capacity, creating complex trade-offs between conservation and development objectives (Adams et al., 2004). The PSR framework is especially valuable in this regard because it allows governance capacity and response feasibility to be considered alongside ecological indicators, thereby supporting more realistic and context-sensitive prioritisation.

5.4. Technological Advances and the Rise of Spatially Explicit Conservation Planning

Advances in geographic information systems (GIS), remote sensing, and spatial modelling have fundamentally reshaped conservation science. High-resolution satellite imagery, time-series analyses, and emerging technologies such as LiDAR have enhanced the monitoring of habitat change, fragmentation, and ecosystem condition across scales (Turner et al., 2003; Foody, 2008; Pettorelli et al., 2014). These tools have enabled conservation priorities to be identified with greater spatial precision and analytical transparency.

When combined with multi-criteria evaluation techniques and PSR-based indicator systems, spatial technologies facilitate integrative conservation planning that accounts for ecological value, threat intensity, and management feasibility. Recent studies increasingly emphasise adaptive, place-based strategies rather than uniform conservation targets, arguing that spatial heterogeneity must be central to prioritisation decisions.

Overall, the literature reveals a clear shift from prescriptive, area-based conservation models toward flexible and integrative prioritisation frameworks. Biodiversity conservation priorities emerge not solely from measures of species richness or endemism, but from the spatial convergence of ecological value, anthropogenic pressure, and response capacity. Embedding these dimensions within a PSR framework enables conservation planning to move beyond descriptive assessments toward actionable strategies that align ecological objectives with territorial realities and governance constraints.

6. Discussion

This chapter contributes to ongoing debates on biodiversity conservation by reframing prioritisation as a spatial and governance-sensitive process rather than a purely ecological exercise. The discussion demonstrates that conservation outcomes are shaped not only by biological value, but also by how pressures are distributed across space and how effectively responses can be mobilised within specific institutional contexts. From a policy perspective, this implies that conservation priorities cannot be derived from universal targets alone; they require place-based interpretation and adaptive governance mechanisms.

A central implication for policy is the need to move beyond static, area-based conservation commitments toward spatially differentiated strategies. Global targets, such as expanding protected-area coverage, provide an important political signal, yet they often fail to capture the uneven geography of biodiversity loss and management capacity. The PSR framework helps clarify why some conservation interventions succeed while others underperform: high ecological value areas subject to intense pressures may not yield meaningful outcomes unless governance capacity and enforcement mechanisms are simultaneously strengthened.

The analysis also highlights the importance of aligning conservation priorities with broader land-use and development policies. Biodiversity-rich regions frequently overlap with agricultural expansion zones, infrastructure corridors, and areas of rapid urbanisation. Without policy coherence across sectors, conservation measures risk being undermined by competing objectives. Integrating PSR-based assessments into spatial planning instruments, environmental impact assessments, and regional development strategies can help identify trade-offs early and support more coherent decision-making.

Finally, the discussion underscores that effective conservation policy must recognise conservation as a negotiated social process. Community engagement, institutional legitimacy, and long-term financing are not secondary considerations but core determinants of success. Spatial prioritisation tools and modelling approaches provide valuable guidance, yet their policy relevance ultimately depends on how transparently they are embedded in governance processes. From this perspective, the PSR framework serves not only as an analytical tool but also as a boundary concept linking science, planning, and policy implementation.

7. Conclusion

This chapter has argued that biodiversity conservation priorities are best understood through a geographical and governance-oriented lens that recognises spatial heterogeneity, differentiated pressures, and variable response capacities. By integrating the Pressure-State-Response framework with spatial prioritisation

concepts, the analysis demonstrates that conservation effectiveness depends as much on institutional feasibility and territorial context as on ecological value. Moving beyond uniform conservation targets toward context-sensitive, spatially explicit strategies offers a more realistic pathway for aligning biodiversity protection with development pressures and governance realities. In this sense, rethinking conservation priorities is not simply a technical challenge, but a fundamentally spatial and policy-driven endeavour.

7.1. Limitations and Future Research

While this chapter provides a conceptual synthesis of biodiversity conservation prioritisation through a geographical PSR framework, several limitations should be acknowledged. First, the discussion remains primarily integrative and conceptual; empirical applications across contrasting regional contexts would further clarify how PSR components interact under different governance regimes. Second, governance capacity and social acceptance,key determinants of conservation success,are often difficult to quantify and remain unevenly represented in spatial models. Future research should therefore focus on developing robust indicators that capture institutional performance, participation, and equity alongside ecological metrics.

Additionally, advances in spatial data, machine learning, and scenario modelling offer opportunities to operationalise PSR-based prioritisation under future climate and land-use trajectories. Integrating these tools with participatory planning processes represents a promising direction for bridging scientific assessment and policy implementation. Such efforts would strengthen the capacity of conservation planning to respond adaptively to accelerating environmental change.

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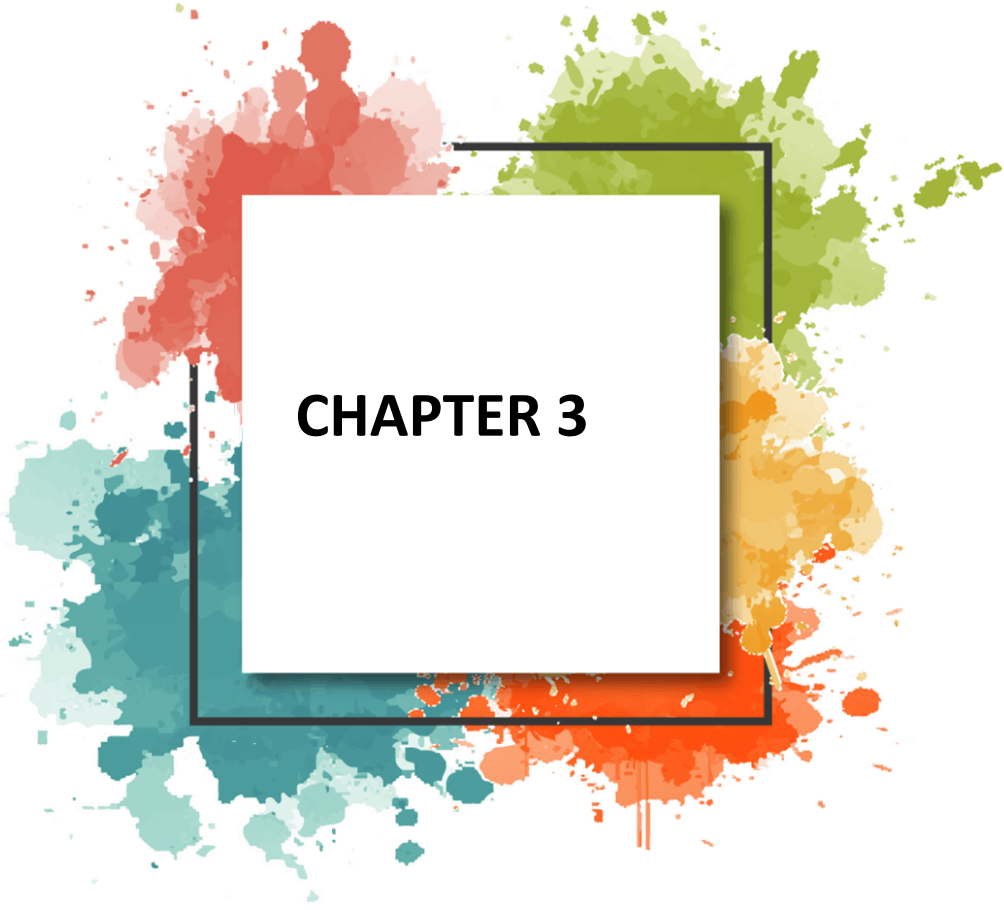
CHAPTER 3

The Role of Artificial Intelligence in The Transition to Strategic Risk Management in Organizations: A Thematic Analysis Study

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1. Introduction

Risk is a fundamental factor to consider in both individual and organizational life. However, due to differences in definition of what risk is, there is no consensus on how to respond to it (Singh, 2012). Risk perception is also variable: individual factors such as gender and age (Skjong & Wentworth, 2001) influence it, while organizational goals and cultural values (Taylor et al., 2006) influence it. Therefore, in academic studies, risk is associated with concepts such as uncertainty (Ostrom & Wilhelmsen, 2019), negativity (COSO, 2013), or opportunity (Lauria, 2015).

As technological transformation accelerates globally, business structures, decision-making processes, and management paradigms are undergoing a radical transformation compared to previous periods. Technological and global developments are offering previously unforeseen conveniences and services in the workplace. Thanks in particular to digitalization, organizations are gaining significant advantages such as operational efficiency, automation, time optimization, and rapid access to information. On the other hand, these transformations and advancements also expose organizations to various uncertainties and new risks. Corporate management's efforts to manage uncertainty and risk are being impacted by these transformational processes (Özbek, 2012). Consequently, risk management has ceased to be a traditional control mechanism focused solely on eliminating threats; it has evolved into a dynamic structure central to organizational resilience, opportunity-creating capacity, strategic forecasting capabilities, and proactive decision-making processes (Nair et al., 2014).

Although it is not possible to define the changes with precise boundaries, the differences in risk management approaches are widely categorized under the headings of traditional, institutional, and strategic risk management (Kızılboğa,

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2012; Soner & Karabacak, 2023). The traditional approach, which emerged in the 1960s, focuses on risk avoidance, leaves responsibility to middle management, and emphasizes financial/actuarial techniques in managing risks (Elsayed et al., 2011; Lauria, 2015). Over time, as non-financial risks such as reputational, social, and environmental risks gained importance, the enterprise risk management approach evolved (Nayak & Akkiraju, 2012; Mansdorf, 2019). While enterprise risk management initially made significant contributions to institutional structures, it has been criticized in recent years for its inadequacy in predicting and managing economic crises (Fraser & Simkins, 2016). In light of these criticisms, the contemporary understanding of risk management requires integration into all decision-making processes and coordination with strategic management, which has led to the emergence of the strategic risk management approach. Strategic management, one element of this conceptual integration, has been used as an indicator of image and maturity in management reports and public statements for many years since its introduction in the 1960s. However, due to the inability to quantify its contributions to institutions, strategic management has faced the risk of losing its effectiveness over time. Therefore, for strategic management to make a meaningful contribution to institutions, it must be adapted to current conditions and integrated with other management approaches (Soner & Karabacak, 2023).

The integration of enterprise risk management and strategic management constitutes strategic risk management. Strategic risk management helps organizations focus on significant risks and identify new opportunities (Kızılboğa, 2012; Stoel et al., 2017). It also examines the impact of risk assessments on an organization's mission, vision, and objectives and enhances the organization's capacity to react to and anticipate potential risks (Delong et al., 2023).

In order to direct risk management in the international arena in the context of corporate image, transparency and sustainability, to create a legal basis and also to guide the risk management transformation processes of organizations, various guides, frameworks and standards have been published by international organizations at different times: COSO (Committee of Sponsoring Organizations of the Treadway Commission), INTOSAI (International Organization of Supreme Audit Institutions) and ISO (International Organization for Standardization) (Özbek, 2012). Of these, the COSO Internal Control—Integrated Framework (1992) includes five components and eighteen principles focused on financial reporting, operational effectiveness, and regulatory compliance objectives. It is also referred to in the literature as the "COSO Cube" due to its cubic representation (COSO, 1992). INTOSAI's 2001 guide differs from COSO in that it includes concepts such as public ethics and reputational risk

(INTOSAI, 2001). COSO Enterprise Risk Management (2004) adopts a three-dimensional approach encompassing objectives, corporate governance structure, and risk management; it emphasizes that risks are not only uncertainties and threats but also opportunities (COSO, 2004). ISO Risk Management—Principles and Guidelines also state that effective risk management adds value to organizations (Özbek, 2012). While these traditional, enterprise risk management-focused guides made significant contributions in their early years, they have fallen short in predicting changes in risk structures in the face of recent global developments (Kıral, 2018). Accordingly, the 2009 version of ISO 31000 was revised in 2018 (ISO, 2018), stating that risks can vary depending on context and should be relevant to all strategic policies (Uysal, 2020). Similarly, the COSO framework, published in 2017 under the title "Enterprise Risk Management - Integration with Strategy and Performance," emphasizes the need to establish strong connections between strategic management and risk management (COSO, 2017). In order for these frameworks to provide the expected benefits and integrate risk management with strategic management, some implementation steps are required: embedding enterprise risk management in the organizational culture (Anderson and Frigo, 2020), embedding it in all management and decision-making processes (COSO, 2017), quantifying its contributions (Nayak and Akkiraju, 2012), appointing units and personnel responsible for risk, ensuring employee participation in the process through training and workshops, utilizing strategic communication and strategic management tools (Soner and Karabacak, 2023), and using technological capabilities such as artificial intelligence in enterprise risk management processes (COSO, 2017).

Today, as a natural consequence of this evolution, risk and strategy are no longer considered distinct processes, but rather intertwined ones. It is precisely at this intersection that artificial intelligence acquires a new function of generating and transferring knowledge; it is no longer merely a process-accelerating technology but rather a cognitive element that reshapes strategic thinking and risk perception (Nedelko et al., 2015; Rigby & Bilodeau, 2017). The speed and accuracy advantages of artificial intelligence applications significantly contribute to the effectiveness of strategic management processes (Borges et al., 2021; Soner & Karabacak, 2023). Therefore, it has become clear that academic interest in the relationship between strategic management and artificial intelligence is rapidly increasing (WOS, 2025; Scopus, 2025).

Despite growing interest, there's no consensus on the benefits and drawbacks that artificial intelligence will bring to our lives. Academic studies are generally categorized into optimistic (positive contributions to the future) and pessimistic (negative impacts) perspectives (Ünal & Kılınç, 2020). Key points highlighted in assessments of the AI-risk management relationship include:

• **Disadvantages:** Privacy and data security risks due to information security breaches (Kurter, 2025; Zhao, 2024); misuse of business processes if not properly programmed and monitored (Mahato, 2022); possibility of making decisions contrary to ethical and moral principles (Prorok & Takács, 2024); difficulty in accessing large data sets required for analysis (Zhao, 2024); need for corporate culture, training and technical competence for effective use (Comite et al., 2025).

• **Benefits:** Predicting risks by quickly analyzing big data (Comite et al., 2025), supporting risk assessment (Berberoğlugil, 2023) and risk reduction/opportunity capture processes (Prorok & Takács, 2024); eliminating time-consuming steps in business processes (Kurter, 2025); producing reliable solutions for complex problems (Mahato, 2022); improving service quality and customer satisfaction (Borges et al., 2021; Berberoğlugil, 2023); gaining proactive capacity against financial/operational/ environmental risks (Comite et al., 2025); facilitating the evaluation of strategic decisions in scenario analyses and improving resource utilization (Prorok & Takács, 2024); deep learning, content generation, review, high-speed analysis on big data (Ünal & Kılınç, 2020; Prorok & Takács, 2024) and cost and time savings (Comite et al., 2025; Berberoğlugil, 2023).

Despite all these benefits and drawbacks, it should be accepted that artificial intelligence is inevitable in the future; adaptation efforts should be focused instead of resistance (Fuhrman & Mooney, 2021). In this context, to mitigate potential drawbacks and leverage the capabilities of AI, it is necessary:

- ✓ Ethical priorities and boundaries should be determined globally across all scientific fields (Ünal & Kılınç, 2020).
- ✓ Risk levels should be defined for tasks and processes; the principle of human superiority should be preserved in human-AI interactions (Köse, 2018).
- ✓ Employees should be trained in AI literacy; AI outputs should be subject to scientific testing before being used directly (Fuhrman & Mooney, 2021; IESE, 2018).
- ✓ Strategic decisions should be made by humans or subject to human oversight (Borges et al., 2021).
- ✓ Questions posed to AI in areas such as risk management should be specific and open-ended; responses should be justified and compared with those from different applications (Lengyel et al., 2024).

Studies in the literature demonstrate that AI applications, particularly as decision support systems, offer significant contributions to risk management processes. However, the relationship between AI and enterprise risk management

has been studied to a limited extent (Borges et al., 2021; Tircovnicu & Hategan, 2023). The reviewed studies indicate that AI applications mostly focus on the areas of finance, information security, and corporate security, and that the relationships are mostly established from the author's perspective and at the technical level. For example, Zhao (2024) used code-based AI applications in a financial risk prediction model. Qi et al. (2024) compared traditional methods for managing information security risks with AI-generated data. Sang and Najihah (2023) examined the functional requirements for an enterprise security management information system and the potential use of AI in system analysis.

In light of the information presented above, it is anticipated that the fundamental transformation that will shape the future of management science will progress through hybrid decision mechanisms in which human and artificial intelligence systems work together. The aim of this study is to contribute to the integration of strategic management and risk management approaches and to determine the role that artificial intelligence applications can play as a strategic management tool in this process. It is evaluated that the study results will provide a visible framework by introducing a new area of discussion into the role of artificial intelligence in corporate risk-strategy relationships and management science. In addition, the study will not only contribute to the existing literature but will also provide a theoretical basis for future experimental, comparative and applied research.

2. Methodology

2.1. Research Design

This study was designed as a qualitative research project aiming to conceptually explore the potential role of artificial intelligence (AI) in the integration of risk management and strategic management. The data were obtained by posing researcher-developed questions to various AI applications using a semi-structured interview technique. The responses provided by these applications were analyzed through the theoretical thematic analysis method. This approach allows for the systematic examination of data within a predetermined theoretical framework (Braun & Clarke, 2006). Theoretical thematic analysis is not merely descriptive but also interpretive and conceptual in nature, enabling an evaluation of the position of AI applications within management science at a theoretical level. The COSO 2017 Enterprise Risk Management (ERM) Framework served as both the theoretical reference point and the main coding axis for the analysis. Thus, COSO 2017 constituted the structural foundation for the study’s theoretical thematization.

2.2. Population and Sample

According to analyses of global information systems, there are more than 10,500 artificial intelligence applications worldwide, encompassing proprietary, local, and enterprise models. However, only a handful of them are widely recognized and used across both academic and professional domains (Onelittleweb, 2025).

For this study, the AI applications ChatGPT, Bing.AI, Gemini.AI, and DeepSeek were selected as the sample. These were chosen because they are publicly accessible, widely used in academic and professional contexts, and offer free access to data. Moreover, their differing infrastructures and algorithmic architectures provided an opportunity to observe and compare diverse perspectives on management-related phenomena (Donanım, 2024; Innova, 2023).

2.3. Data Collection Process

The data collection process was conducted through semi-structured interviews, a method that allows researchers to maintain flexibility within a predefined set of questions and to elicit more comprehensive and original responses from participants (in this case, AI applications) (Akman & Erişen, 2022; Şencan, 2005).

Based on the COSO 2017 framework, the researchers developed seven open-ended questions:

1.Can artificial intelligence applications be defined as a new strategic management tool?

2.Is there a relationship between artificial intelligence applications and the enterprise risk management approach?

3.Theoretically, how can artificial intelligence applications contribute to the “Governance and Culture” component of the COSO 2017 ERM Framework?

4.Theoretically, how can artificial intelligence applications contribute to the “Strategy and Objective Setting” component of the COSO 2017 ERM Framework?

5.Theoretically, how can artificial intelligence applications contribute to the “Performance” component of the COSO 2017 ERM Framework?

6.Theoretically, how can artificial intelligence applications contribute to the “Review and Revision” component of the COSO 2017 ERM Framework?

7.Theoretically, how can artificial intelligence applications contribute to the "Information, Communication, and Reporting" component of the COSO 2017 ERM Framework?

Each question was directed separately to all four AI applications. The responses were recorded in their raw form, without any linguistic or contextual modification. This ensured that the unique expression styles of the AI systems were preserved, allowing for the examination of how they conceptualize corporate governance processes.

The data collection process included the following steps:

- Structuring the questions according to the COSO 2017 framework.
- Administering the questions to each AI model in an online environment.
- Recording the responses in their original form.
- Transferring the raw responses into NVivo for qualitative data analysis.

2.4. Data Analysis

The collected data were analyzed using the theoretical thematic analysis approach. The purpose of this method is to identify patterns, similarities, and differences within the data based on a specific theoretical framework—in this case, the COSO 2017 ERM Framework. This framework served as both the theoretical reference and the structural foundation for the thematic coding process. Accordingly, the responses of AI applications were analyzed in the context of the components of enterprise risk management, and their positions within the integration of risk and strategy were conceptually interpreted.

The analysis process followed the five-step structure proposed by Braun and Clarke (2006):

1.Familiarization with the Data: Reading the raw responses multiple times to establish a general understanding of their meaning.

2.Generating Initial Codes: Identifying key concepts associated with the five components of COSO 2017.

3.Constructing Themes: Grouping similar meaning clusters to form coherent themes.

4.Reviewing Themes: Evaluating conceptual overlaps to ensure theoretical integrity among themes.

5.Interpreting Themes: Explaining how each theme reflects the theoretical positioning of AI within the context of enterprise risk management.

2.5. Reliability and Validity

In qualitative research, reliability and validity are achieved through transparency in research procedures and the consistency of findings with the data (Başkale, 2016; Arslan, 2022).In this study, reliability was ensured through four key principles:

•**Credibility:** The coding process was documented step-by-step based on the collected responses, and the analytical structure was explicitly aligned with COSO 2017 components.

•**Transferability:** The methods and analytical steps were described in detail, creating a replicable model for similar studies.

•**Dependability:** Data were collected from multiple AI systems, adopting a multi-source data approach.

•**Confirmability:** Findings were derived directly from raw data, and interpretations were constructed based on data-driven evidence.

Furthermore, intercoder reliability between two independent researchers was calculated as 85% agreement (Cohen's Kappa = 0.81), which supports the robustness of the analytical process.

3. Results

In this section, the themes, subthemes, and representative quotations derived from the theoretical thematic analysis of the data obtained from artificial intelligence applications (ChatGPT, Bing.AI, Gemini.AI, and DeepSeek) are presented. As a result of the analysis, the responses provided by the AI applications to the research questions were categorized under five main themes.

Theme-1: Governance and Culture

Artificial intelligence describes its contribution to governance and corporate culture as a "data-driven integrity provider." Applications have demonstrated that concepts such as transparency, accountability, and ethical compliance within organizations can now be supported not only by human behavior but also by data-driven systems.

Artificial intelligence can increase organizational risk awareness by continuously collecting data on employee behavior, performance trends, and corporate communication patterns. This allows managers to detect potential ethical violations or organizational weaknesses early.

In this respect, AI can be considered not only a technical analysis tool but also a "silent observer of corporate ethics and governance culture." This approach allows corporate culture to evolve into a dynamic structure fueled by data.

The coding process related to the theme “Governance and Culture” is presented in Table 1.

Table 1: Coding Process for the Theme “Governance and Culture”

Code	Subtheme	Main Theme
Monitoring ethical compliance	Ethical behavior and accountability	Governance and Culture
Reducing bias through automation	Data-based ethical supervision	
Organizational behavior analysis	Behavioral analysis and cultural awareness	
Transparency and accountability	Transparency culture	
Sentiment analysis for risk culture	Risk awareness culture	

The representative responses of AI applications regarding this theme suggest that artificial intelligence supports an ethical and transparent governance culture and functions as a proactive monitoring tool:

•**ChatGPT:** “AI applications contribute to the formation of behaviors based on system integrity, transparency, and risk awareness across the organization.”

•**Bing.AI:** “Artificial intelligence reshapes corporate governance through automation, predictive analytics, and ethical oversight.”

•**Gemini.AI:** “AI can analyze internal communications and performance records to identify cultural indicators consistent or inconsistent with risk management principles.”

•**DeepSeek:** “Machine learning models can detect behavioral anomalies that signal unethical conduct or a weak risk culture.”

Theme-2: Strategy and Objective Setting

The second theme highlights the role that AI plays in strategy-making processes. All four AI applications emphasized that AI's "forecasting" and "scenario planning" capabilities have become decisive in determining the strategic direction of organizations.

Through machine learning, natural language processing, and big data analytics, AI can generate probabilistic future scenarios by scanning both internal and external environmental factors. These scenarios help organizations develop balanced, data-driven strategies aligned with their risk appetite.

In this sense, AI not only performs analysis but also assumes the role of a "predictive strategy architect" in the strategic management process. AI's simulation-based insights have become a critical support mechanism for managers, particularly in resource allocation, performance targets, and long-term vision formulation.

The coding process related to the theme “Strategy and Objective Setting” is presented in Table 2.

Table 2: Coding Process for the Theme “Strategy and Objective Setting”

Code	Subtheme	Main Theme
Scenario modeling	Probability-based scenario analysis	Strategy and Objective Setting
Predictive analytics for decision-making	Data-driven strategic foresight	
Risk–return optimization	Risk–return balance	
Alignment with risk appetite	Strategic alignment	
Dynamic modeling	Adaptive decision-making	

The representative responses show that AI enhances flexibility and resilience in strategic management through predictive analytics:

•**ChatGPT:** “AI enables data-driven strategic decisions aligned with an organization’s risk appetite and long-term value creation goals.”

•**Bing.AI:** “AI-powered systems analyze large datasets to identify emerging trends, quantify uncertainties, and develop risk-oriented strategic choices.”

•**Gemini.AI:** “AI algorithms model different strategic scenarios, anticipate potential risks associated with each option, and strengthen the resilience of strategic objectives.”

•**DeepSeek:** “AI supports the development of adaptive strategies that remain aligned with strategic goals through real-time risk-adjusted decision-making.”

Theme-3: Performance Management

This theme focuses on the function of AI in the "performance" domain, the third component of the COSO-2017 Enterprise Risk Management Framework. AI has the capacity to monitor organizations' performance and risk indicators in real time.

Responses from applications demonstrate that AI can detect deviations early through predictive analytics and enable organizations to take proactive action. This represents a shift to a management model where risks are not only "detected" but also "anticipated."

For example, Gemini.AI stated that AI supports "dynamic decision-making processes" by integrating risk and performance data. Such systems go beyond traditional performance measurement and generate strategic feedback based on instantaneous data.

As a result, AI has become not just a measurement tool in performance management, but also a "digital component of organizational reflexes."

The coding process related to the theme “Performance Management” is presented in Table 3.

Table 3: Coding Process for the Theme “Performance Management”

Code	Subtheme	Main Theme
Real-time monitoring	Instant performance tracking	Performance Management
Key risk indicators	Risk performance metrics	
Anomaly detection	Deviation analysis and early warning	
KPI–KRI integration	Performance–risk integration	
Automated evaluation reporting	Automated performance reporting	

The representative responses indicate that AI transforms performance assessment from a static into a dynamic, data-driven process:

•**ChatGPT:** “AI integrates risk and performance data to provide a holistic perspective on organizational effectiveness.”

•**Bing.AI:** “AI-supported analytics enable continuous evaluation of performance by processing large datasets.”

•**Gemini.AI:** “AI algorithms predict the likelihood and impact of risks with higher precision, enabling the development of more effective risk response strategies.”

•**DeepSeek:** “AI ensures dynamic performance management aligned with strategic objectives through real-time risk monitoring and predictive performance analytics.”

Theme-4: Continuous Learning and Adaptation

One of the most significant contributions of AI is its ability to strengthen organizations' learning and adaptability. The analyzed responses demonstrate that AI can evaluate the effectiveness of risk management policies by continuously learning from past data. This theme aligns with organizational learning theory. AI can improve future decision-making processes by drawing inferences from past mistakes or examples of success. This contributes to the organization's transformation into a structure that not only identifies risks but also "learns through risk."

DeepSeek and Bing.AI stated that AI establishes a "cyclical learning mechanism" to continuously test the effectiveness of strategies and policies. This feature directly aligns with the "Review and Revision" component of COSO-2017.

The coding process related to the theme “Continuous Learning and Adaptation” is presented in Table 4.

Table 4: Coding Process for the Theme “Continuous Learning and Adaptation”

Code	Subtheme	Main Theme
Continuous learning cycle	Continuous learning and adaptation	Continuous Learning and Adaptation
Feedback-based improvements	Feedback-oriented development	
Adaptive risk assessment	Dynamic risk assessment	
Model improvement via machine learning	Data-driven model updating	
Automated compliance checks	Continuous auditing and control	

Representative responses emphasize AI’s contribution to strengthening organizational learning loops and automating revision processes:

•**ChatGPT:** “AI supports continuous learning and adaptive risk management processes from the perspective of organizational learning and cybernetic systems.”

•**Bing.AI:** “Machine learning algorithms continuously refine risk management models by identifying emerging patterns.”

•**Gemini.AI:** “AI analyzes risk events and control effectiveness data to identify areas requiring timely revision.”

•**DeepSeek:** “AI systems automate continuous improvement cycles through advanced analytics and adaptive learning, enhancing organizational agility.”

Theme-5: Intelligent Automation

The final theme concerns the role of AI in information management, communication, and reporting processes. AI, particularly through natural language processing and natural language generation techniques, can simplify complex data and report it appropriately to different stakeholders. This reduces information asymmetry and increases corporate transparency. Automatic reports generated by AI enable decision-makers to access information quickly and accurately, thus strengthening the flow of information between the board and operational units.

Bing.AI and ChatGPT applications have defined this feature as an "intelligent communication bridge." This role of AI in information management not only increases efficiency but also contributes to the establishment of risk awareness at the corporate level.

The coding process related to the theme “Intelligent Automation” is presented in Table 5.

Table 5: Coding Process for the Theme “Intelligent Automation”

Code	Subtheme	Main Theme
Automated risk reporting	Automated information sharing	Intelligent Automation
Natural language generation	Clear report creation	
Data synthesis and integration	Data unification and analysis	
Sentiment and stakeholder analysis	Stakeholder communication and feedback	
Transparency and timeliness	Transparent and timely information flow	

The representative responses show that AI can enhance transparency and participation by facilitating two-way communication and intelligent reporting systems:

•**ChatGPT:** “AI improves the quality, timing, and relevance of risk-related information flows, supporting transparent and informed decision-making.”

•**Bing.AI:** “Natural language processing tools summarize complex reports to ensure clear and accessible communication.”

•**Gemini.AI:** “AI generates comprehensive and timely risk reports, ensuring that accurate information reaches the right stakeholders.”

•**DeepSeek:** "AI transforms static reporting into interactive and adaptive processes, enhancing risk transparency and strategic alignment."

Thematic Evaluation

The overall results of the thematic analysis demonstrate that artificial intelligence acts as a holistic actor within the COSO 2017 Enterprise Risk Management Framework (see Figure 1).

Figure 1: Theoretical Theme Map

AI supports governance culture, shapes strategic objectives, monitors performance, learns continuously, and enhances reporting mechanisms. Thus, AI is not merely a technological innovation but has evolved into the strategic backbone of organizational decision-making systems. All four applications consistently emphasized that AI has begun to assume the role of a "strategic partner" or "governance facilitator" in contemporary organizations.

4. Discussion

This study analyzed the role of emerging AI applications at the intersection of the disciplines of enterprise risk management and strategic management, directly using outputs derived from these systems. The findings demonstrate that AI is more than just a technical tool supporting operational processes; it also plays a transformative role in strategic management, performance monitoring, continuous learning, and reporting mechanisms. In this context, the research has

yielded theoretical implications that call for rethinking the current position of AI in management science.

In this section, the findings obtained from the research are discussed in line with the relevant literature and theoretical framework; the meanings regarding the position of artificial intelligence between risk management and strategic management disciplines are interpreted.

4.1. Integration of Artificial Intelligence into Management Disciplines

The definition of AI applications as a "modern strategic management tool" demonstrates a fundamental transformation of the paradigm that has shaped the tool-centric nature of management science for many years. While traditional strategic management tools—benchmarking, balanced scorecard, TQM, reengineering models, or customer-centric segmentation approaches—provide managers with support that remains largely analytical, AI systems have become not merely technical tools providing information for decision-making processes but also active management components that interpret data, recognize patterns, generate predictive outcomes, generate alternative scenarios under uncertainty, and provide real-time feedback on organizational behavior. This transformation is directly consistent with the findings of Nedelko and colleagues (2015) that "management tools adapt to changes in the technological and institutional environment like evolving organisms." This study examined the use of 25 different management tools by managers in Slovenia and Croatia, and found that the use of management tools, particularly in transition economies, is constantly reshaped in parallel with technological innovations and institutional needs. The most striking finding of the study is that current use strongly predicts future intentions. This suggests that the adoption of a management tool in organizations is shaped not only by its technical benefits but also by managers' experiential relationship with the tool. At this very point, AI applications constitute a new stage in the natural evolution of management tools: Unlike traditional tools, they not only support the process but also offer a dynamic learning structure that influences the organization's strategic direction, processes environmental signals, and expands its foresight capacity. Thus, AI is evolving from being a passive element of the management tools ecosystem into a decisive strategic actor transforming the corporate decision-making architecture.

The study's findings revealed that AI plays a decisive role not only in operational processes such as risk prediction or performance monitoring, but also in more abstract, organizational-level areas such as governance, culture, and strategy formulation. This closely aligns with the framework emphasized by Fraser and Simkins (2016) in the enterprise risk management literature. Fraser and Simkins demonstrate, through a detailed case study of Hydro One, that for enterprise risk management to be successful, the risk management function must

have sufficient authority and independence, risk must be systematically integrated into all critical decision processes, and risk awareness must be made a natural component of the corporate culture. Designing enterprise risk management in this way creates a governance infrastructure that generates continuous feedback and encourages learning within the organization. Similarly, Mahato (2022) defines AI as a cognitive system that mimics human thinking and learning processes, analyzes complex data, supports decision-making processes through risk assessment models, predictive analyses, and increased diagnostic accuracy. He emphasizes that it strengthens risk assessment, workflow efficiency, and foresight capacity in areas such as healthcare, manufacturing, and security. When these two approaches are considered together, it is possible to argue that the findings in our study position AI not merely as a technical automation tool, but as a strategic management infrastructure that strengthens the link between risk management, governance, and strategy, and accelerates organizational learning cycles by transferring risk information to different levels of the organization. Thus, artificial intelligence functions as a dynamic learning mechanism that supports the risk culture and management structures envisaged by corporate risk management, detects new risk signals, records them in corporate memory and triggers strategy updates.

Within the COSO 2017 Enterprise Risk Management (ERM) Framework, AI interacts with all five components:

•**Governance and Culture:** AI supports ethical behavior, accountability, and transparency through data-driven insights.

•**Strategy and Objective Setting:** Machine learning–based foresight makes strategic planning more objective and evidence-based.

•**Performance:** AI contributes to the early detection of risks and strengthens proactive decision-making mechanisms.

•**Review and Revision:** Continuous learning and adaptive capabilities enhance organizational resilience.

•**Information, Communication, and Reporting:** AI facilitates faster and more reliable information flows, improving managerial awareness.

This interaction structure demonstrates that AI transforms risk management from a reactive control mechanism into a proactive strategic partner that helps shape organizational direction.

The study demonstrated that AI establishes a multidimensional relationship with the five main components of the COSO-2017 framework. The structure of the interaction can be broadly categorized as shown in Table 6:

Table 6: Contribution Profile of Artificial Intelligence in the Context of COSO-2017 Components

COSO Components	Contribution of AI	Teorik Sonuç
Governance & Culture	Ethical violation detection, communication analysis, corporate behavior mining	The partial transfer of governance from humans to machines
Strategy & Objective Setting	Scenario generation, uncertainty simulation, risk appetite mapping	Strategy is no longer solely based on human intelligence
Performance	Real-time monitoring of key risk indicators (KRIs)/key performance indicators (KPIs)	Performance management is becoming fluid, not static
Review & Revision	Machine learning-based feedback loop	The organization is rapidly transforming into a learning organism
Information & Reporting	Automatic report generation, summarizing the basics of natural language processing (NLP)	Information now reaches the manager in an interpreted form

4.2. Artificial Intelligence and the New Dimension of Strategic Transformation

The themes emerging from the research clearly demonstrate the potential of AI in "strategic foresight generation." AI, through its capacity to interpret large data sets, generate probability-based scenarios, and simulate different risk-opportunity configurations, facilitates decision-making under uncertainty and serves as a "foresight infrastructure" that increases organizations' strategic resilience. This finding is consistent with the positioning of strategic management tools as a backbone integrating enterprise risk management and strategic management in the Strategic Management Tools-Based Enterprise Risk Management (SYAD-ERM) Model, developed within the framework of the COSO ERM 2017 Framework (Soner & Karabacak, 2023). The aim of this study is to concretize the extent and how institutions use strategic management tools, how integrated this use is with risk management, and the resulting maturity level through an index (SYAD-KRY Index); the proposed model and index provide a self-assessment framework that relates institutional risk management maturity to strategic foresight and opportunity generation capacity. Similarly, Rigby and Bilodeau's global management tools and trends study, conducted with a repetitive survey design among 1,268 executives, tracks the use of digital tools such as advanced analytics, the Internet of Things, and agile management. The findings indicate that digital transformation is accelerating the shift from hierarchical

structures to a team-based, adaptable, and rapidly adaptable "technology-enabled strategic agility." From this perspective, the ability of AI applications to transform big data into scenario-based strategic insights not only deepens the risk-strategy integration established through strategic management tools emphasized in Soner and Karabacak's maturity index approach, but also takes the technology-driven agility logic proposed by Rigby and Bilodeau to a new level, enabling organizations to build dynamic, learning, and proactive decision-making structures. In other words, AI is not merely a tool that provides efficiency; it is a transformative factor that plays a role in redefining strategic orientations and risk appetite. Furthermore, the impact of AI on strategic planning aligns with the concept of the "learning organization," which is increasingly prominent in management literature. The emphasis on continuous learning and adaptation seen in the responses of DeepSeek and Bing.AI recalls the fundamental principles of Cybernetic Systems Theory (feedback). From this perspective, AI provides organizations not only with data but also with a way of thinking, contributing to the formation of a "digital reflex" in management processes.

4.3. The Theoretical Transformative Role of AI in Enterprise Risk Management

Artificial intelligence expands the functional boundaries of enterprise risk management, turning it into a bridge mechanism that integrates risk management with strategic management. This finding directly corresponds with COSO 2017's emphasis on "the integration of risk with strategy and performance."

Artificial intelligence has evolved into a decision-support infrastructure capable of not only identifying risks but also analyzing how they relate to corporate objectives, risk appetite, and value creation goals. Through big data analytics, pattern recognition, and predictive modeling techniques, AI makes it clear which strategic objectives a given risk threatens, which opportunity areas it intersects with, and the potential impacts of different risk scenarios on corporate performance. Thus, the risk management process is moving beyond a mere assurance mechanism centered on control and auditing, as emphasized by Anderson and Frigo (2020) in their guide "Creating and Protecting Value: Understanding and Implementing Enterprise Risk Management," developed for COSO, and is becoming a value-creation process integrated into the preliminary stages of strategic planning. In this guide, the authors state that the aim is to manage risks from both a value creation and value preservation perspective by integrating enterprise risk management into the organization's strategy formulation, goal setting, and performance management cycles. They position risk management not as a standalone, "sideline" function, but as a business model component that permeates all processes. They argue that enterprise risk management cannot truly create value when conducted separately from core

processes such as strategic planning, investment decisions, and change management; therefore, a clear link must be established between risk appetite, strategic objectives, and performance indicators. At this point, AI-based risk analytics provides a dynamic framework that links risks to corporate strategy, providing strong theoretical and practical support for Anderson and Frigo's "value creation-oriented risk management" approach: risk management becomes an integrated value architecture that serves not only to prevent losses but also to design strategic objectives in a more informed, data-driven and proactive manner.

In this context, AI's contribution is twofold:

1.Analytical Contribution: It establishes causal relationships within complex datasets, enabling early risk detection.

2.Conceptual Contribution: It transforms risk perception from a static structure into a dynamic system where the organization functions as a continuously learning and adaptive entity.

Therefore, AI elevates enterprise risk management from a protective mechanism to a core component of strategic thinking and value creation. This shift redefines the nature of managerial decision-making by embedding analytical intelligence directly into strategic processes.

4.4. Limitations and Directions for Future Research

The study is limited to responses obtained from four publicly accessible and widely recognized AI applications. Future research could broaden this scope by including AI models with distinct algorithmic architectures—such as proprietary corporate AI systems or sector-specific applications—to enhance generalizability. Moreover, as this study was conducted at a theoretical level, future empirical research could collect quantitative or mixed-method data to measure the concrete impact of AI applications on organizational risk management and strategic decision-making. Cross-country comparative studies could also examine cultural differences in AI-driven management practices, contributing to an understanding of whether AI functions as a universal or context-specific managerial tool. Additionally, as AI becomes increasingly embedded in decision-making processes, there is a growing need for deeper research on ethical responsibility, data privacy, and algorithmic accountability. Integrating quantitative methods, such as models measuring the relationship between AI utilization and corporate performance, would further enrich the understanding of AI's transformative role in management science.

4.5. Original Contribution to the Literature

This study generates innovation at three distinct levels:

Theoretical Contribution: Artificial intelligence (AI) is modeled for the first time as an active actor within strategic risk management.

Methodological Innovation: AI systems were directly queried, and their responses were interpreted through thematic analysis.

Governance Perspective: A new paradigm is proposed in which decision-making processes partially shift from human agents to machine intelligence.

A particularly notable aspect of originality lies in the methodological approach: while the majority of existing studies treat AI as an input–output mechanism or a passive analytical object, this research elevates AI to the level of an epistemic subject. By examining how AI itself conceptualizes core elements of risk governance, the study offers a fundamentally new lens for understanding the evolving human–machine relationship in strategic risk management.

5. Conclusion

This study used thematic analysis to examine the theoretical role of AI in integrating the disciplines of risk management and strategic management. The research's unique approach is to directly assess the position of AI applications (ChatGPT, Bing.AI, Gemini.AI, DeepSeek) within the enterprise risk management framework based on their own responses.

The findings demonstrate that AI functions not only as an operational decision-support tool but also as a strategic partner and catalyst for organizational transformation. AI's self-description as a "modern strategic management tool" demonstrates that the role of technology in management sciences has reached a formative, not merely supportive, level.

The study reached the following key conclusions:

•Artificial intelligence represents a new phase in the evolution of strategic management tools. Strategic management processes are now supported by data-driven, predictive, and continuously learning systems, moving beyond traditional tools. This demonstrates that the management approach is being redefined with artificial intelligence.

•The enterprise risk management framework is being deepened by AI. AI contributes to each of the five components of ERM (governance, strategy, performance, review, and communication) at different levels. The effectiveness of AI has increased significantly, particularly in strategy formulation, performance monitoring, and information management processes.

•Artificial intelligence is evolving from a reactive tool to a proactive actor in risk management. Artificial intelligence can be considered a system that not only analyzes risks but also anticipates changes in the risk environment and develops

strategic adaptation mechanisms. This increases the resilience of institutions in the face of uncertainty.

•Artificial intelligence strengthens organizational adaptation by accelerating institutional learning. The study defines AI as an element that contributes to institutions becoming self-renewing systems through continuous data analysis and feedback loops.

•The integration of AI and management also re-emerges with the issue of ethics and governance. The inclusion of AI in decision-making processes creates new risks in the areas of data security, algorithmic transparency, and accountability. Therefore, strengthening ethical principles and oversight mechanisms in AI-based management systems is essential.

This study has made three theoretical contributions to the literature:

- ✓ The position of artificial intelligence within management science has been subjectivized. In this context, evaluating the responses of artificial intelligence from its own perspective represents an epistemological approach often overlooked in management literature. This method provides a new perspective that considers technology not merely as a tool but as a "thinking system."
- ✓ It established a new theoretical link by linking the COSO-2017 Enterprise Risk Management model to artificial intelligence. This conceptually explains how artificial intelligence contributes to abstract concepts in risk management (governance culture, strategic alignment, learning cycle, etc.).
- ✓ Demonstrated the transformative impact of artificial intelligence in the digitalization of strategic management tools. This study positions artificial intelligence as a "meta-management system" rather than a "tool" among management tools.

The research findings provide several implications for managers and organizations. The use of AI-supported systems in decision-making processes can accelerate strategic planning and reduce errors. Real-time performance monitoring and risk prediction systems can increase organizations' resilience to uncertainty. Intelligent automation in information and reporting processes can reduce the time it takes for decision-makers to access information, increasing managerial efficiency. Strengthening corporate ethics policies and audit structures will be a critical requirement for managing AI-related risks. However, while adopting these processes, organizations must simultaneously develop not only technological investments but also cultural and managerial transformation strategies.

In conclusion, this study demonstrates that artificial intelligence is not merely a technological innovation in corporate governance, but a new management paradigm. By deepening the interaction between risk management and strategic management, artificial intelligence provides institutions with both foresight and adaptability. In this respect, artificial intelligence represents a turning point in the corporate governance literature. Future research testing this theoretical framework across different institutions, sectors, and cultural contexts will provide new insights into the digitalization of management science.

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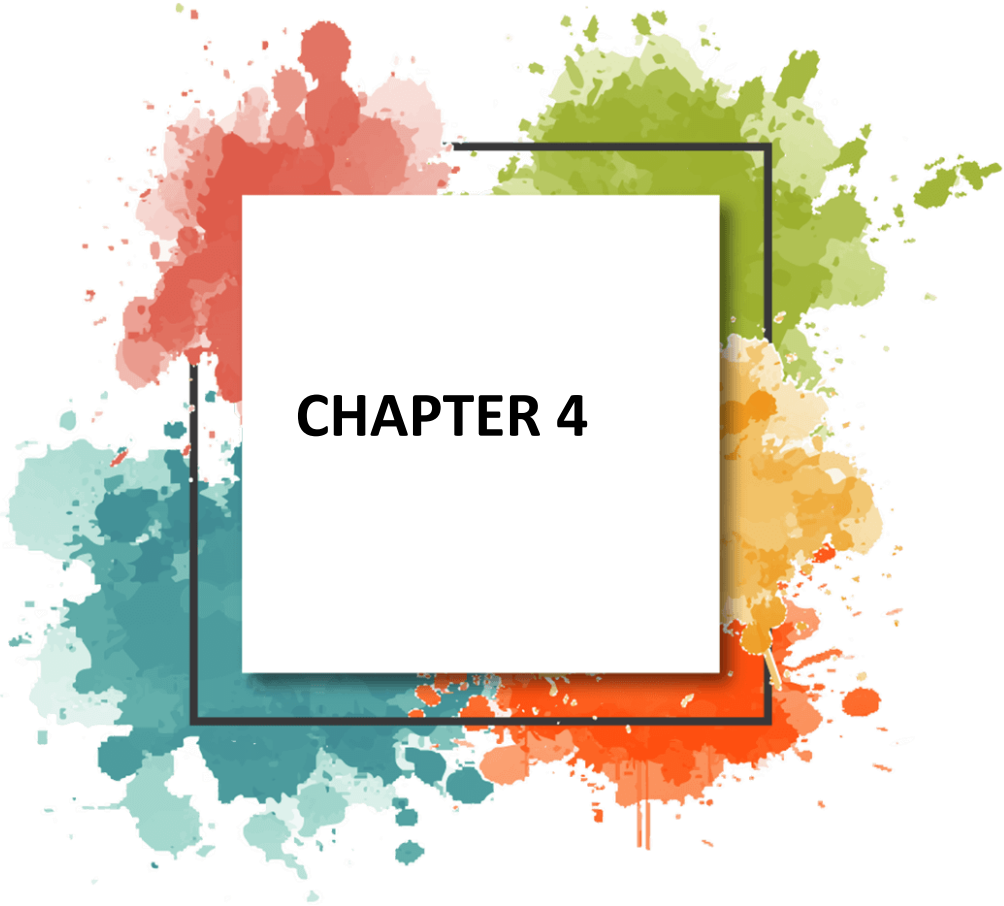
CHAPTER 4

AI Governance Regimes in the Digital Political Economy

Marijana Zimonjić[1] & Milinko Veličković[2]

INTRODUCTION

Artificial intelligence is most often presented in contemporary political and public debates as a technological innovation with the potential to enhance productivity, efficiency, and social development. However, such narratives frequently overlook the fact that the development, deployment, and regulation of artificial intelligence take place within specific political-economic structures. Algorithms, models, and digital infrastructures are not neutral technical artifacts; rather, they are deeply embedded in power relations, capital interests, and institutional arrangements that shape the global economy. For this reason, artificial intelligence constitutes a central issue in the contemporary digital political economy and, increasingly, a domain of political-economic governance.[3]

Over the past decade, accelerated digitalization and the expansion of the platform economy have led to a concentration of power in the hands of a limited number of states and technology corporations. Control over data, computational infrastructure, and advanced algorithmic systems has become a key source of structural power in the international system. In this context, the governance of artificial intelligence cannot be reduced to questions of technical safety or ethical guidelines alone. Instead, it involves the construction of governance regimes through which decisions are made about the distribution of resources, market competition, sovereignty, and social inequalities.

Alongside technological development, recent years have witnessed intensified institutional activity aimed at governing artificial intelligence. Different political systems have developed distinct AI governance regimes that reflect their political-economic priorities and configurations of power. The European Union has emerged as a regulatory and normative actor, seeking to establish global standards for "responsible" artificial intelligence through legal frameworks. The United States relies on a market-oriented governance regime in which technology

[1] Assist. Prof., Megatrend University, Belgrade, Orcid: 0009-0005-6323-0393
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[3]Strange, S. (1996). *The retreat of the state: The diffusion of power in the world economy*. Cambridge university press.

corporations play a dominant role, while the state intervenes selectively, primarily through a security and geopolitical lens. China, by contrast, has developed a state-centered governance regime in which artificial intelligence is embedded within broader strategies of industrial planning, social governance, and political control.

These divergent approaches indicate the emergence of multiple AI governance regimes at the global level. Importantly, these regimes do not represent mere technical responses to technological progress. Rather, they are the outcome of political-economic negotiations and conflicts among states, capital, and international institutions. As such, AI governance regimes function as mechanisms through which power is institutionalized, shaping access to technology, the allocation of risks, and the distribution of economic and political benefits.

Drawing on the framework of international political economy, this chapter analyzes AI governance regimes as political-economic arrangements embedded in the digital political economy, rather than as neutral regulatory structures. The central research question guiding the analysis is: how are AI governance regimes formed within the digital political economy, and which power relations do they reflect and reproduce? Particular attention is paid to the roles of states, large technology corporations, and international institutions, as well as to the political-economic consequences of these regimes for global inequalities and democratic accountability.[4]

The chapter is structured as follows. First, it outlines the theoretical framework of digital political economy and examines artificial intelligence as a strategic resource in contemporary capitalism. It then analyzes the emergence of AI governance regimes, followed by a comparative examination of regulatory models in the European Union, the United States, and China. Finally, it discusses the broader political-economic implications of these regimes for the global order.

1. DIGITAL CAPITALISM AND DATA AS A RESOURCE

The development of artificial intelligence is inseparably linked to the transformation of contemporary capitalism toward digital and platform-based models of accumulation. Within the framework of digital political economy, artificial intelligence cannot be analyzed in isolation as a technological innovation, but rather as an integral component of a broader system of value production structured around data extraction, processing, and commercialization. This form of capitalism is characterized by the concentration of economic and

[4]El-Hibri, H., Khalil, J. F., Steinberg, M., Zhang, L., & Mukherjee, R. (2025). States and platform capitalisms: A conversation. *Platforms & Society, 2*, 29768624251395354.

political power around digital platforms that control key resources of the digital economy and increasingly shape emerging governance regimes.[5]

In this context, data emerge as a central resource of contemporary capitalism, comparable to raw materials or energy in earlier industrial phases.[6] Unlike traditional resources, however, data are not depleted through use; instead, their value increases through aggregation, networking, and algorithmic processing. Digital platforms function as infrastructural intermediaries that organize markets, capture data, and establish the conditions for a new phase of capitalist accumulation based on network effects and monopolization.[7] Artificial intelligence plays a pivotal role in this process, operating as a core mechanism for extracting value from data by enabling automated analysis, behavioral prediction, and the optimization of market coordination.

The political-economic significance of data becomes particularly visible when analyzed through the lens of structural power. Control over knowledge, productive structures, and infrastructural systems constitutes a key dimension of power in the international political economy. In the digital economy, data and algorithms function as central sources of structural power, enabling dominant actors to shape market access, influence patterns of consumption, and impose technical and regulatory standards on other participants.[8] This dynamic is especially pronounced in the field of artificial intelligence, where access to large-scale datasets represents a precondition for developing advanced models, thereby reinforcing barriers to entry and consolidating existing power asymmetries.

Critical approaches to digital capitalism emphasize that data extraction and algorithmic governance frequently operate beyond democratic oversight and with limited social accountability. This process has been conceptualized as "surveillance capitalism," in which data derived from human behavior are commodified and artificial intelligence is deployed for predictive control and commercial exploitation. While such perspectives sometimes understate the role of the state, they effectively illuminate the structural power imbalances that emerge in governance regimes dominated by private corporations controlling data infrastructures and analytical capacities.

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[5]Zuboff, S. (2023). The age of surveillance capitalism. In *Social theory re-wired* (pp. 203–213). London: Routledge.
[6]Strange, S. (1996). *The retreat of the state: The diffusion of power in the world economy*. Cambridge: Cambridge University Press.
[7]Srnicek, N. (2017). The challenges of platform capitalism: Understanding the logic of a new business model. *Juncture, 23*(4), 254–257.
[8]Aradau, C., & Blanke, T. (2022). *Algorithmic reason: The new government of self and other*. Oxford: Oxford University Press.

Beyond their economic function, data as a resource also carry a pronounced geopolitical dimension. Digital infrastructure—including cloud systems, data centers, and algorithmic platforms—has become a foundational component of contemporary sovereignty. States that lack the capacity to generate, store, and analyze large volumes of data become structurally dependent on global technology actors, a condition that deepens global inequalities between advanced economies and the Global South and constrains national autonomy within global AI governance regimes.

In this sense, artificial intelligence does not merely reflect existing power relations within digital capitalism; it actively contributes to their institutionalization. Data as a strategic resource enable the concentration of economic value, political influence, and regulatory authority, providing the structural foundations upon which contemporary AI governance regimes are built. Understanding artificial intelligence as embedded within the digital political economy is therefore a necessary analytical step for explaining how governance regimes emerge, stabilize, and reproduce power relations in the regulation of artificial intelligence.

1.1 Algorithmic Power and Market Structures

The development of artificial intelligence affects not only the technological capacities of contemporary economies but also fundamentally transforms market structures and forms of economic power. Within digital capitalism, algorithms do not function as neutral tools for information processing; rather, they have become central mechanisms of coordination, selection, and control of economic activity. Algorithmic systems organize markets, govern labor processes, shape consumer preferences, and structure competition, thereby assuming roles previously played by prices, contracts, and regulatory institutions in earlier phases of capitalism.

In this context, algorithmic power can be understood as a specific form of structural power within the digital political economy.[9] This form of power derives from the capacity of certain actors to design, control, and deploy algorithmic systems that mediate economic relations. Algorithmic systems frequently operate as "black boxes," whose decision-making criteria remain opaque, protected by commercial secrecy, and largely removed from public scrutiny. Such opacity enables the concentration of power among actors who possess technical expertise and ownership over algorithmic infrastructure, while other market participants are positioned in structurally subordinate roles.

[9]Zimonjić, M. (2024). Uticaj digitalne transformacije na konkurentsku prednost preduzeća. *Megatrend Review/Megatrend Revija, 21*(1).

Algorithmic power directly shapes the structure of market competition. Digital platforms deploy artificial intelligence to optimize pricing, rank products, manage content visibility, and direct information flows.[10] These practices generate strong network effects, whereby the value of a platform increases with the number of users and the volume of data it controls, further raising barriers to entry for potential competitors. The result is a tendency toward market concentration and monopolization, in which a small number of dominant actors control key segments of the digital economy.

Critical analyses warn that algorithmic systems not only reproduce existing inequalities but often intensify them. Algorithms—particularly in domains such as employment, credit allocation, and social policy—can function as "weapons of mathematical destruction" by automating discriminatory patterns and shifting responsibility away from institutions toward ostensibly objective technical processes. In market contexts, such systems weaken the bargaining positions of workers, consumers, and smaller firms, while simultaneously reinforcing the control exercised by dominant platforms.

Algorithmic power also carries a significant political-economic dimension, as it reshapes the relationship between the state and the market. The depoliticization of economic decision-making through technological mediation allows market interests to be presented as technical necessities. In this sense, algorithms become instruments through which economic power is legitimized and stabilized, often in the absence of meaningful democratic deliberation. Confronted with the complexity of algorithmic systems, states increasingly adopt regulatory frameworks that market actors themselves have helped to shape, further blurring the boundary between public regulation and private governance.

These dynamics have direct implications for the development of artificial intelligence governance regimes. Market structures shaped by algorithmic power produce asymmetric relationships between regulators and regulated actors. Large technology corporations, by virtue of their resources, expertise, and control over digital infrastructure, exert disproportionate influence over the definition of standards and rules governing AI. As a result, governance regimes do not emerge as neutral responses to technological risks, but rather as institutional compromises that reflect and reinforce existing market hierarchies.[11]

Ultimately, algorithmic power and the transformation of market structures constitute a crucial link between digital capitalism and emerging AI governance

[10]Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Cambridge, MA: Harvard University Press.
[11]O'Neil, C. (2017). *Weapons of math destruction: How big data increases inequality and threatens democracy*. New York, NY: Crown.

regimes. Understanding these processes makes it possible to conceptualize AI regulation not merely as a legal or ethical issue, but as a political-economic process through which power, competition, and social benefits are distributed within the contemporary global economy.

2. EMERGING REGIMES OF ARTIFICIAL INTELLIGENCE GOVERNANCE

The accelerated development of artificial intelligence and its expanding application across economic, security, and social domains have led to the formation of new institutional arrangements aimed at governing its use. In contemporary scholarship, these arrangements are increasingly described as artificial intelligence governance regimes, encompassing sets of rules, norms, standards, and institutions through which the development, deployment, and oversight of AI systems are regulated. From the perspective of international political economy, however, these regimes cannot be understood as neutral or purely technical responses to innovation, but rather as political-economic constructions that reflect power relations embedded in digital capitalism.[12]

In international political economy, the concept of regimes traditionally refers to relatively stable configurations of principles, norms, and rules around which actors' expectations converge within specific areas of global governance. Applying this concept to artificial intelligence enables an analysis of how diverse interests—such as national security, market competition, technological dominance, and social protection—are institutionalized through regulatory and normative frameworks. In this sense, AI governance regimes constitute arenas of negotiation between states and capital, as well as spaces in which global hierarchies of knowledge and power are further consolidated.

Unlike classical domains of global economic governance, such as trade or finance, the governance of artificial intelligence is characterized by a high degree of fragmentation and institutional pluralism. No single global regulatory framework for AI currently exists. Instead, governance is organized through a complex network of national regulations, regional initiatives, and international normative processes. International organizations such as the OECD and UNESCO play an important role in articulating principles and ethical guidelines, yet their influence remains largely normative rather than legally binding. This reliance on soft law mechanisms facilitates broad participation by diverse actors, while simultaneously limiting the prospects for the redistribution of power and responsibility.

[12]Hendrikse, R., Adriaans, I., Klinge, T. J., & Fernandez, R. (2022). The big techification of everything. *Science as Culture, 31*(1), 59–71.

A defining feature of contemporary AI governance regimes is the asymmetric distribution of influence among actors. States seek to protect national interests, security, and sovereignty through regulation, but remain structurally dependent on the technological capacities of private actors. Large technology corporations, by contrast, possess infrastructural and epistemic power that enables them to actively shape regulatory frameworks—often through advisory processes, standard-setting initiatives, and public–private partnerships. As a result, the boundary between public governance and private self-regulation becomes increasingly blurred.

From the standpoint of digital political economy, these regimes can be understood as institutional responses to the structural transformations produced by digital capitalism. As demonstrated in the preceding chapters, the concentration of data, the expansion of algorithmic power, and increasing market monopolization generate new forms of dependency and inequality. AI governance regimes do not emerge in a vacuum; rather, they are shaped by existing market structures and power relations. Consequently, regulatory frameworks often favor actors that already possess the resources required to comply with complex standards, while smaller actors and states with weaker institutional capacities face additional barriers to technological access and participation.

An especially significant issue concerns democratic accountability within AI governance regimes. Decision-making processes related to AI governance frequently take place within technical and expert-driven forums that remain largely inaccessible to broader publics. As a result, political decisions regarding the distribution of risks, benefits, and control over technology are depoliticized and reframed as technical matters. This dynamic contributes to democratic deficits and constrains societal oversight of the development and deployment of artificial intelligence.

In this context, emerging AI governance regimes can be interpreted as mechanisms that stabilize digital capitalism rather than fundamentally transform it. While they introduce important discourses surrounding ethics, security, and responsible innovation, their capacity to challenge entrenched power relations remains limited. For this reason, the analysis of AI governance regimes requires a comparative perspective capable of revealing how different political-economic systems institutionalize AI governance in distinct ways.

This chapter therefore, provides the theoretical and analytical foundation for the subsequent comparative analysis of regulatory models in the European Union, the United States, and China. By comparing these models, it becomes possible to identify not only differences in institutional design, but also the deeper political-

economic logics that shape contemporary global governance of artificial intelligence.[13]

2.1 The Global Institutional Framework of Artificial Intelligence Governance

The governance of artificial intelligence at the global level has developed under conditions of pronounced institutional fragmentation and the absence of a binding international regulatory regime. Unlike domains such as trade or finance, which are governed by formalized multilateral frameworks, artificial intelligence is regulated through a complex network of international organizations, normative initiatives, and informal standards that together constitute the global institutional framework of AI governance. This framework relies heavily on soft law mechanisms, a feature that carries significant political-economic implications.[14]

International organizations play a central role in shaping the global discourse on artificial intelligence. The Organisation for Economic Co-operation and Development (OECD) occupies a particularly influential position, as its AI Principles represent one of the earliest efforts to formulate a shared normative framework among advanced economies. These principles emphasize innovation, economic growth, and the "responsible" use of AI, while simultaneously reflecting the interests of states and market actors that dominate the OECD. From an international political economy perspective, the OECD's approach can be understood as an attempt to harmonize rules without disrupting existing market structures or undermining the technological competitiveness of leading economies.

Alongside the OECD, UNESCO plays an important normative role through its Recommendation on the Ethics of Artificial Intelligence, the first global document of its kind adopted within the United Nations system. UNESCO's approach foregrounds human rights, inclusiveness, and social responsibility, thereby seeking to expand discussions of AI beyond narrowly economic and security-oriented frameworks. Nevertheless, despite its strong symbolic and discursive significance, the non-binding character of this document limits its practical impact in terms of power redistribution or enforceable regulation.[15]

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[13]Filgueiras, F. (2022). Artificial intelligence policy regimes: Comparing politics and policy to national strategies for artificial intelligence. *Global Perspectives, 3*(1), 32362.
[14]Zekos, G. I. (2022). Digital economy and politics. In *Political, Economic and Legal Effects of Artificial Intelligence: Governance, Digital Economy and Society* (pp. 49-84). Cham: Springer International Publishing.
[15]Chauhan, M., & Perera, I. M. (2024). Artificial intelligence: promises, perils—and political economy. *French Politics*, *22*(2), 152-163.

The broader United Nations system also contributes to global AI governance through various agencies, working groups, and reports. These initiatives frequently focus on sustainable development, the digital divide, and the implications of artificial intelligence for the Global South. However, the fragmentation of the UN system and the competing interests of member states hinder the establishment of a coherent and binding global AI regime. As a result, UN initiatives primarily contribute to normative framing and the legitimation of certain principles, but rarely advance to the stage of concrete implementation.

A defining feature of the global institutional framework for artificial intelligence governance is its reliance on soft law mechanisms. These mechanisms include ethical guidelines, voluntary standards, codes of conduct, and recommendations that lack legal binding force but exert considerable influence over actors' expectations and practices. The primary advantage of soft law lies in its flexibility and capacity to adapt rapidly to technological change. From a political economy perspective, however, soft law frameworks often favor actors with greater institutional and economic power, who are better positioned to shape the definition of norms and standards.

Reliance on soft law also produces broader political-economic consequences. First, it facilitates the depoliticization of conflicts surrounding AI governance by reframing fundamentally political questions as technical or ethical issues. Second, soft law regimes constrain democratic accountability, as decision-making processes take place within expert-driven and transnational forums that are frequently inaccessible to broader publics. Third, this institutional configuration complicates efforts to address global inequalities, as it lacks mechanisms for compulsory redistribution or sustained support for states with weaker technological capacities.[16]

In this sense, the global institutional framework of artificial intelligence governance can be understood as a compromise among competing interests within the digital political economy. While it enables coordination and normative convergence, it simultaneously stabilizes existing power relations among advanced economies, technology corporations, and states with limited institutional capacity. For this reason, analysis of the global institutional framework cannot be separated from a comparative examination of national and regional regulatory models.

[16]Brass, I., & Hornsby, D. J. (2018). Digital technological innovation and the international political economy. In *The Palgrave handbook of contemporary international political economy* (pp. 615-631). London: Palgrave Macmillan UK.

3. COMPARATIVE ANALYSIS OF ARTIFICIAL INTELLIGENCE GOVERNANCE REGIMES: THE EU, THE UNITED STATES, AND CHINA

Contemporary regimes of artificial intelligence governance develop within distinct political-economic systems, resulting in the formation of divergent regulatory models. Although these models are often presented as technical responses to the shared challenges posed by artificial intelligence, from the perspective of international political economy they reflect different configurations of power among the state, capital, and the market. A comparative analysis of the European Union, the United States, and China makes it possible to identify these differences and to examine how global institutional frameworks of AI governance are translated into concrete political-economic practices.[17]

3.1 The European Union: A Regulatory–Normative Model

The artificial intelligence governance regime in the European Union is characterized by a strong reliance on formal regulation and normative power. The EU positions itself as an actor seeking to establish standards for the development and deployment of AI through legally binding frameworks, with an emphasis on the protection of fundamental rights, safety, and accountability. This approach draws on the broader tradition of European regulatory capitalism, in which rules and standards function as key instruments of political authority.

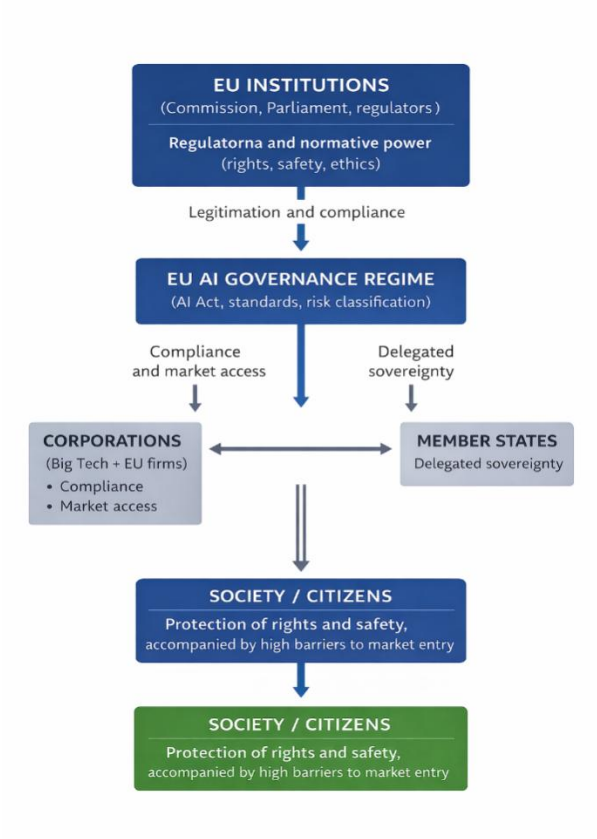
A central feature of this model is the classification of AI systems according to levels of risk, directing regulatory attention toward areas considered socially sensitive. While this approach aims to protect citizens and increase trust in technology, it simultaneously generates significant compliance costs. From a political economy perspective, these costs have redistributive effects, as they favor large corporations with sufficient resources to adapt to complex regulatory requirements, while creating additional barriers to market entry for smaller actors.[18]

At the global level, the European model aspires to exert extraterritorial influence through the export of regulatory standards and norms. This phenomenon—often described as the "Brussels effect"—enables the European Union to shape global AI governance despite its limited control over core technological infrastructure. In doing so, the EU reinforces its position as a normative power, while leaving open the question of whether this regulatory

[17]Dixon, R. B. L. (2023). A principled governance for emerging AI regimes: lessons from China, the European Union, and the United States. *AI and Ethics*, *3*(3), 793-810.
[18]Alic, D. (2021). The role of data protection and cybersecurity regulations in artificial intelligence global governance: A comparative analysis of the European Union, the United States, and China regulatory framework. *Search in*.

strategy genuinely alters existing power relations within digital capitalism or primarily serves to institutionalize them.[19]

Figure 1:The Regulatory–Normative Model of Artificial Intelligence Governance in the European Union



Source: Author's own illustration based on the analysis of EU AI governance.

This figure illustrates the regulatory–normative model of artificial intelligence governance in the European Union. EU institutions serve as the central source of regulatory and normative power, shaping AI governance through legally binding frameworks, standards, and risk classification. The governance regime mediates relationships between corporations and member states through compliance

[19]Du, J. (2025). Toward Responsible and Beneficial AI: Comparing Regulatory and Guidance-Based Approaches-A Comprehensive Comparative Analysis of Artificial Intelligence Governance Frameworks across the European Union, United States, China, and IEEE. *arXiv preprint arXiv:2508.00868*.

requirements and delegated sovereignty. At the same time, its effects extend to society through the protection of rights and safety, accompanied by increased barriers to market entry.

3.2 The United States: A Market–Corporate Model

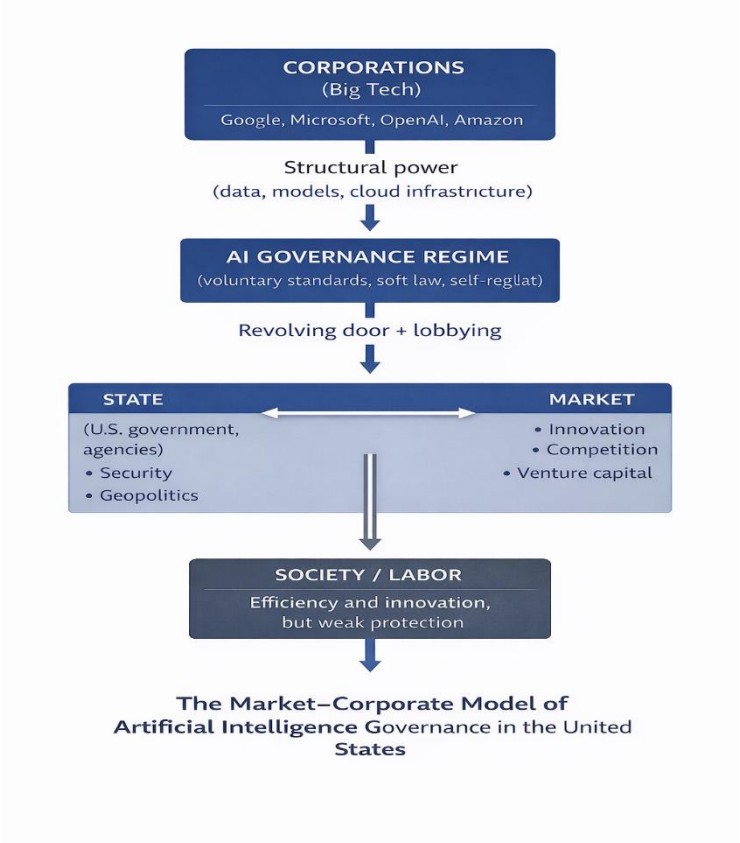
In contrast to the European regulatory approach, the artificial intelligence governance regime in the United States is based on a market-oriented logic in which technology corporations play a dominant role. State intervention is selective and primarily takes place through security, geopolitical, and strategic policies, while broader AI regulation relies on voluntary standards, self-regulation, and fragmented, sector-specific initiatives.

Within this model, the algorithmic and infrastructural power of large technology companies constitutes a key source of influence in shaping AI governance regimes. Control over data, cloud infrastructure, and advanced AI models enables private actors to function as *de facto* regulatory authorities. Public institutions frequently depend on the expertise and technical capacities of the private sector, further blurring the boundary between public policymaking and market-based governance.[20]

The political-economic implication of this approach is the reproduction of platform capitalism through AI governance regimes. Innovation and competitiveness are prioritized over rights protection and the redistribution of benefits, while negative social consequences are often treated as secondary concerns. Although this model facilitates rapid technological development and the global market dominance of U.S.-based firms, it simultaneously deepens social inequalities and constrains opportunities for democratic oversight of artificial intelligence.

[20]Bal, R., & Gill, I. S. (2020). Policy approaches to artificial intelligence based technologies in China, European Union and the United States.

Figure 2: The Market–Corporate Model of Artificial Intelligence Governance in the United States



Source: Author's own illustration based on the analysis of United States AI governance.

This figure illustrates the market–corporate model of artificial intelligence governance in the United States. Technology corporations function as the primary holders of structural power through their control over data, advanced AI models, and cloud infrastructure. AI governance is largely shaped through voluntary standards, soft law mechanisms, and self-regulation, reinforced by revolving-door dynamics and lobbying. The governance regime mediates interactions between the state and the market, prioritizing innovation, competitiveness, and geopolitical considerations, while its societal effects include efficiency gains alongside limited protections for labor and broader social interests.[21]

[21]Hine, E., & Floridi, L. (2024). Artificial intelligence with American values and Chinese characteristics: a comparative analysis of American and Chinese governmental AI policies. *Ai & society*, *39*(1), 257-278.

3.3 China: A State-Centered Model

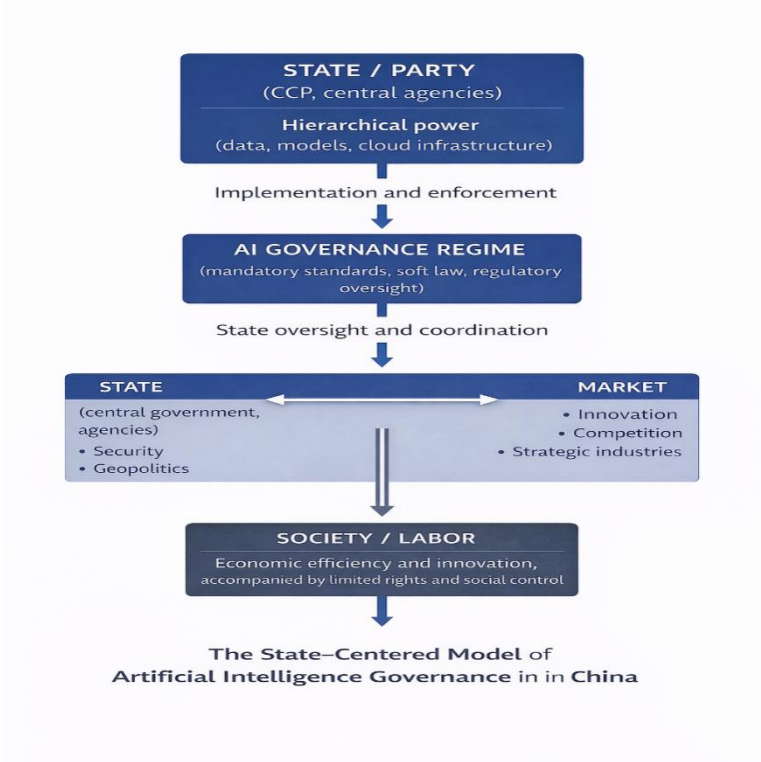
The artificial intelligence governance regime in China is based on the strong role of the state as the central actor in the development, deployment, and control of AI technologies. Artificial intelligence is integrated into broader strategies of industrial planning, national security, and social governance, with the state establishing clear directives and binding standards for private actors.

Unlike the U.S. model, in which corporations enjoy significant autonomy, technology companies in the Chinese context operate as extensions of state strategy. Their market power and innovative capacities are subordinated to political objectives, including social stability, surveillance, and geopolitical competition. In this model, algorithms and data function primarily as instruments of state power rather than as mechanisms of market-based accumulation.[22]

The political-economic effects of this approach include a high degree of state capacity for coordination and policy implementation, alongside significant constraints on individual rights and the autonomy of market actors. The Chinese model demonstrates that alternative AI governance regimes can effectively mobilize resources and accelerate technological development, but at the cost of increased centralization of power and a reduced space for democratic participation.[23]

[22]Roberts, H., Cowls, J., Hine, E., Morley, J., Wang, V., Taddeo, M., & Floridi, L. (2023). Governing artificial intelligence in China and the European Union: Comparing aims and promoting ethical outcomes. *The Information Society*, *39*(2), 79-97.
[23]Lindh, M. (2022). The Geopolitics of Artificial Intelligence: A Comparative Policy Analysis of French and Chinese Artificial Intelligence Policy Discourse.

Figure 3: The State-Centered Model of Artificial Intelligence Governance in China



Source: Author's own illustration based on the analysis of China AI governance.

This figure illustrates the state-centered model of artificial intelligence governance in China. The state and the Communist Party function as the primary holders of hierarchical power through their control over data, algorithms, and digital infrastructure. AI governance is embedded within broader strategies of industrial planning, national security, and social governance. The governance regime coordinates state and market actors while prioritizing political stability, strategic objectives, and technological development, producing societal outcomes characterized by efficiency and innovation alongside constrained rights and limited democratic oversight.

3.4 Comparative Synthesis

The comparative analysis demonstrates that the differences among the European Union, the United States, and China cannot be reduced to varying degrees of regulation, but rather reflect distinct political-economic logics of artificial intelligence governance. The European model privileges regulatory and normative power, the U.S. model emphasizes market-based and corporate

dominance, while the Chinese model places primary emphasis on hierarchical state control. Although these models produce divergent institutional outcomes, all three institutionalize artificial intelligence as a strategic resource and a key source of power in the contemporary global order.

This comparative perspective reinforces the central argument of the chapter that emerging AI governance regimes are not neutral technical frameworks, but political-economic arrangements that reflect and reproduce existing power relations. Understanding these differences constitutes a necessary step for analyzing the broader implications of artificial intelligence for global inequalities, democracy, and sovereignty.

Table 1: Comparative Synthesis of AI Governance Regimes

Dimension	European Union	United States	China
Dominant actor	Regulator	Corporations	State
Type of power	Normative	Structural (capital-based)	Hierarchical
Role of regulation	Central	Secondary	Instrumental
State–capital relationship	Negotiation	Symbiosis	Subordination
Global effect	Export of rules	Export of technology	Export of infrastructure

The table demonstrates that the differences among the European Union, the United States, and China do not stem solely from divergent regulatory styles, but from deeper political-economic structures and configurations of power. While all three models recognize artificial intelligence as a strategic resource, how power is institutionalized and projected globally differ significantly, with important implications for global governance, inequalities, and the future development of the digital political economy.

4. POLITICAL-ECONOMIC CONSEQUENCES: GLOBAL INEQUALITIES, DEMOCRACY, AND SOVEREIGNTY

Different artificial intelligence governance regimes generate profound and long-term political-economic consequences that extend beyond national boundaries. Although these regimes are often presented as technical or ethical responses to the challenges posed by AI, their effects materialize through the redistribution of power, resources, and political control within the global digital economy. This section examines three key dimensions of these consequences:

global inequalities, democratic accountability, and the transformation of sovereignty.

AI governance regimes significantly contribute to the deepening of existing global inequalities between advanced economies and the Global South. Control over data, digital infrastructure, and advanced AI models is concentrated in a limited number of states and corporations, producing asymmetric patterns of dependency. States with weaker institutional and technological capacities are frequently relegated to the roles of users or providers of raw data, without meaningful opportunities to participate in value creation or in the definition of governing rules.

The global institutional framework—largely reliant on soft law mechanisms—further reinforces these inequalities. Norms and standards formulated by international organizations and advanced economies often become global reference points, yet without adequate mechanisms of support for their implementation in less developed states. In this way, AI governance regimes function as mechanisms of selective inclusion, enabling market access while simultaneously constraining technological autonomy.

As emphasized by Daron Acemoglu and Simon Johnson, technological development in itself does not guarantee inclusive growth; without appropriate institutional interventions, it may further concentrate wealth and power. In the context of artificial intelligence, this dynamic manifests in a "digital divide" that is no longer limited to access to technology, but increasingly concerns participation in its governance.[24]

A second major consequence concerns the impact of AI governance regimes on democratic processes and accountability. Across all analyzed models—albeit in different forms—a democratic deficit is evident. Decisions regarding the development, deployment, and regulation of artificial intelligence are frequently made within narrow expert-driven and technocratic circles, with limited participation by citizens, trade unions, or civil society organizations.

In market-oriented models such as the U.S. case, corporate dominance in standard-setting and practice formation leads to the privatization of technology governance. In regulatory models such as the European Union's, despite the presence of formal democratic procedures, the complexity of regulation and the technical nature of decision-making constrain meaningful public deliberation. In

[24]Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American economic review*, *91*(5), 1369-1401.

state-centered models such as China's, democratic oversight is explicitly subordinated to the political objectives of the state.

Critical analyses, including those developed by Virginia Eubanks, highlight that automated decision-making systems can further marginalize social groups that already possess limited political voice. In this sense, AI governance regimes do not merely reflect existing democratic deficits, but technologically institutionalize them by transforming political decisions into ostensibly neutral algorithmic processes.[25]

The third dimension of political-economic consequences relates to the transformation of sovereignty. Within the digital political economy, sovereignty is increasingly defined not solely by territorial control, but by authority over data, infrastructure, and standards. AI governance regimes thus become key instruments through which "digital sovereignty" is redefined.

In the European context, sovereignty is partially delegated to supranational institutions to enhance regulatory power. In the U.S. model, sovereignty is fragmented and shared with private actors that control critical technological resources. In the Chinese model, sovereignty is consolidated through centralized state control over data and technology. Although these strategies differ, they share a common feature: the classical model of state sovereignty is transformed rather than unequivocally strengthened.

For states in the Global South, this transformation often entails a loss of autonomy, as dependence on foreign platforms and standards constrains the capacity for independent technological development. As a result, AI governance regimes become embedded within broader patterns of the global political economy, in which power is increasingly redistributed toward transnational and technological actors.

This analysis confirms the central argument of the chapter that emerging AI governance regimes constitute political-economic arrangements reflecting the interests of dominant actors, rather than neutral responses to technological development. The concluding section synthesizes these findings and considers potential alternative pathways for the future governance of artificial intelligence.

CONCLUSION

This chapter departed from the premise that artificial intelligence cannot be understood solely as a technological innovation, but rather as a central element of the contemporary digital political economy. Through an analysis of the

[25]Eubanks, V. E. (2007). Trapped in the digital divide: The distributive paradigm in community informatics. *The Journal of Community Informatics*, *3*(2).

development, regulation, and institutional governance of AI, it has demonstrated that emerging governance regimes do not constitute neutral technical responses to innovation, but political-economic arrangements that reflect and reproduce power relations among states, capital, and international institutions.

Drawing on the theoretical framework of digital political economy, the chapter has shown that data, algorithms, and digital infrastructure have become key resources of contemporary capitalism. Control over these resources enables actors to shape markets, steer innovation, and influence regulatory processes. Algorithmic power, as a specific form of structural power, transforms market relations and generates new forms of dependency, both within national economies and at the global level.

The analysis of the global institutional framework has revealed that AI governance develops under conditions of fragmentation and a strong reliance on soft law mechanisms. While international organizations contribute to the formulation of norms and ethical principles, their capacity to deliver binding and redistributive regulation remains limited. This institutional configuration facilitates coordination and legitimization of existing practices, while simultaneously stabilizing the dominant positions of the most technologically and economically powerful actors.

The comparative analysis of the European Union, the United States, and China further confirmed the central argument of the chapter: AI governance regimes differ primarily in terms of the political-economic logics that shape them. The European Union relies on a regulatory–normative model in which rules and standards serve as the primary instruments of power. The United States favors a market–corporate model in which technology companies play a central role in defining governance practices. China, by contrast, has developed a state-centered model in which artificial intelligence is embedded within broader strategies of industrial planning, surveillance, and political control. Despite their institutional differences, all three models treat artificial intelligence as a strategic resource of critical importance for economic development and geopolitical positioning.

The political-economic consequences of these regimes are particularly evident in the domains of global inequalities, democracy, and sovereignty. AI governance regimes contribute to the deepening of global asymmetries between technologically advanced economies and the Global South, constraining opportunities for inclusive technological development. At the same time, decision-making processes related to AI frequently unfold outside traditional democratic mechanisms, producing democratic deficits and the depoliticization of fundamentally political questions. The transformation of sovereignty in the digital era further complicates these dynamics, as power becomes increasingly

tied to control over data, infrastructure, and standards rather than territorial boundaries.

Based on this analysis, it can be concluded that contemporary AI governance regimes, in their current form, possess limited capacity to bring about a substantive transformation of existing power relations within digital capitalism. While they may reduce certain risks and enhance predictability, in most cases, they function as mechanisms for the institutionalization and legitimation of dominant interests. This does not imply that alternative trajectories are impossible, but rather that they would require deeper political-economic interventions that go beyond technical regulation and ethical guidelines.

Future research could focus on the analysis of alternative models of artificial intelligence governance that incorporate stronger mechanisms of democratic oversight, international redistribution of resources, and greater participation by Global South states in the formulation of global norms. It is also important to examine how existing AI governance regimes are reshaped in the context of intensifying geopolitical tensions and increasing technological fragmentation of the global order.

In conclusion, this chapter demonstrates that artificial intelligence constitutes one of the key arenas of contemporary political economy, where questions of power, capital, sovereignty, and democracy intersect. Understanding AI as a political-economic phenomenon represents a necessary precondition for envisioning more just and inclusive forms of its future governance.

DIRECTIONS FOR THE FUTURE GOVERNANCE OF ARTIFICIAL INTELLIGENCE

Based on the analysis presented in this chapter, several directions for improving artificial intelligence governance regimes can be identified that could contribute to reducing political-economic inequalities and strengthening democratic accountability. First, it is necessary to enhance international coordination beyond the framework of soft law through the development of minimal binding standards, particularly in the areas of fundamental rights protection, algorithmic transparency, and accountability for the harmful effects of AI systems. Although a fully binding global regime currently appears unfeasible, sector-specific international agreements could represent a realistic step toward more robust global governance.

Second, AI governance regimes should incorporate more democratic decision-making mechanisms through the institutionalized participation of civil society organizations, trade unions, and the academic community in regulatory processes. Such inclusion would help mitigate existing democratic deficits and limit the dominance of expert-driven and corporate actors in rule-setting. Particular

attention should be paid to the transparency of standard-setting and regulatory decision-making processes to enable meaningful public oversight of the development and deployment of artificial intelligence.

Third, addressing global inequalities requires targeted policies aimed at building technological capacities in Global South countries. This includes investments in digital infrastructure, open access to knowledge and data, and institutional support for the development of local AI ecosystems. Without such interventions, global AI governance regimes will continue to reproduce patterns of dependency and technological subordination.

Finally, national and regional regulatory frameworks should integrate artificial intelligence into broader strategies of industrial policy and social protection. Rather than focusing exclusively on security and innovation, AI governance policies should address issues of labor, redistribution, and long-term social sustainability. Such an approach could enable artificial intelligence to function as a tool for inclusive development, rather than as an additional source of power concentration within the contemporary digital political economy.

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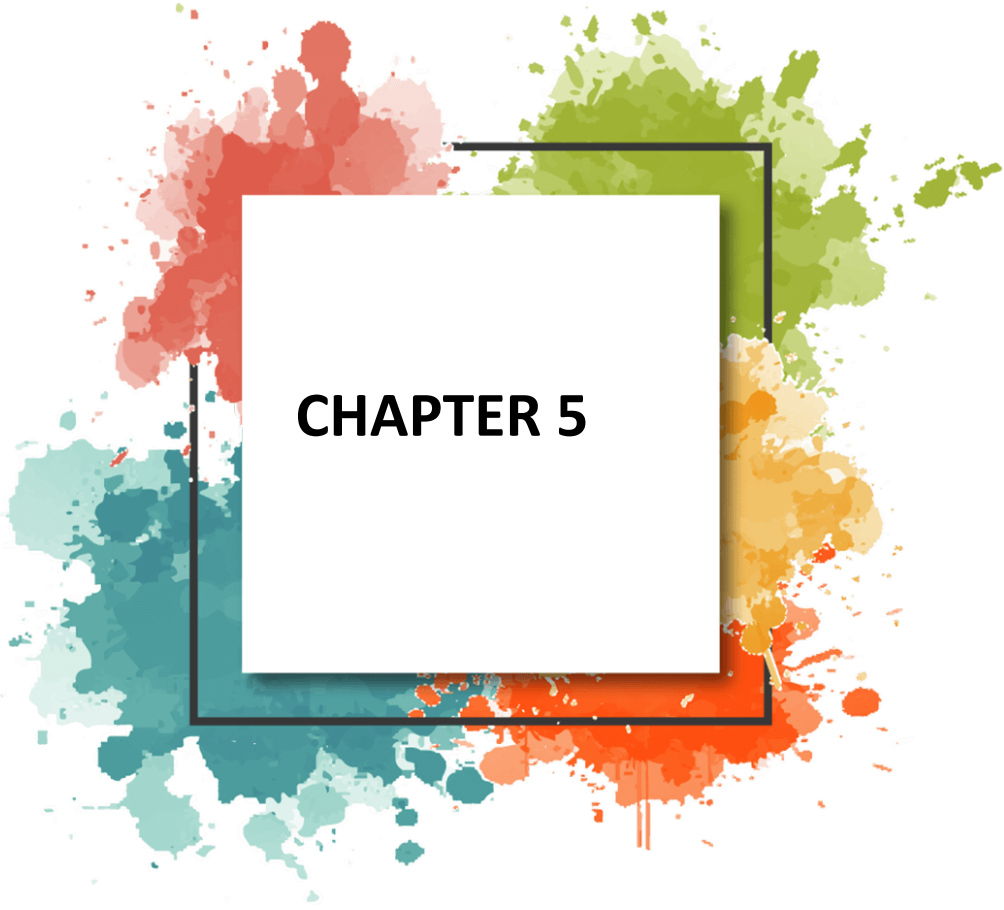
CHAPTER 5

The Role of Artificial Intelligence in the Transition to Strategic Risk Management in Organizations: A Thematic Analysis Study

***Murat Soner*[1] *& Mevlüt Karadağ*[2]**

1. Introduction

Risk is a fundamental factor to consider in both individual and organizational life. However, due to differences in definition of what risk is, there is no consensus on how to respond to it (Singh, 2012). Risk perception is also variable: individual factors such as gender and age (Skjong & Wentworth, 2001) influence it, while organizational goals and cultural values (Taylor et al., 2006) influence it. Therefore, in academic studies, risk is associated with concepts such as uncertainty (Ostrom & Wilhelmsen, 2019), negativity (COSO, 2013), or opportunity (Lauria, 2015).

Menekşe DeresiAs technological transformation accelerates globally, business structures, decision-making processes, and management paradigms are undergoing a radical transformation compared to previous periods. Technological and global developments are offering previously unforeseen conveniences and services in the workplace. Thanks in particular to digitalization, organizations are gaining significant advantages such as operational efficiency, automation, time optimization, and rapid access to information. On the other hand, these transformations and advancements also expose organizations to various uncertainties and new risks. Corporate management's efforts to manage uncertainty and risk are being impacted by these transformational processes (Özbek, 2012). Consequently, risk management has ceased to be a traditional control mechanism focused solely on eliminating threats; it has evolved into a dynamic structure central to organizational resilience, opportunity-creating capacity, strategic forecasting capabilities, and proactive decision-making processes (Nair et al., 2014).

Menekşe DeresiAlthough it is not possible to define the changes with precise boundaries, the differences in risk management approaches are widely categorized under the headings of traditional, institutional, and strategic risk management (Kızılboğa, 2012; Soner & Karabacak, 2023). The traditional

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approach, which emerged in the 1960s, focuses on risk avoidance, leaves responsibility to middle management, and emphasizes financial/actuarial techniques in managing risks (Elsayed et al., 2011; Lauria, 2015). Over time, as non-financial risks such as reputational, social, and environmental risks gained importance, the enterprise risk management approach evolved (Nayak & Akkiraju, 2012; Mansdorf, 2019). While enterprise risk management initially made significant contributions to institutional structures, it has been criticized in recent years for its inadequacy in predicting and managing economic crises (Fraser & Simkins, 2016). In light of these criticisms, the contemporary understanding of risk management requires integration into all decision-making processes and coordination with strategic management, which has led to the emergence of the strategic risk management approach. Strategic management, one element of this conceptual integration, has been used as an indicator of image and maturity in management reports and public statements for many years since its introduction in the 1960s. However, due to the inability to quantify its contributions to institutions, strategic management has faced the risk of losing its effectiveness over time. Therefore, for strategic management to make a meaningful contribution to institutions, it must be adapted to current conditions and integrated with other management approaches (Soner & Karabacak, 2023).

Menekşe DeresiThe integration of enterprise risk management and strategic management constitutes strategic risk management. Strategic risk management helps organizations focus on significant risks and identify new opportunities (Kızılboğa, 2012; Stoel et al., 2017). It also examines the impact of risk assessments on an organization's mission, vision, and objectives and enhances the organization's capacity to react to and anticipate potential risks (Delong et al., 2023).

Menekşe DeresiIn order to direct risk management in the international arena in the context of corporate image, transparency and sustainability, to create a legal basis and also to guide the risk management transformation processes of organizations, various guides, frameworks and standards have been published by international organizations at different times: COSO (Committee of Sponsoring Organizations of the Treadway Commission), INTOSAI (International Organization of Supreme Audit Institutions) and ISO (International Organization for Standardization) (Özbek, 2012). Of these, the COSO Internal Control—Integrated Framework (1992) includes five components and eighteen principles focused on financial reporting, operational effectiveness, and regulatory compliance objectives. It is also referred to in the literature as the "COSO Cube" due to its cubic representation (COSO, 1992). INTOSAI's 2001 guide differs from COSO in that it includes concepts such as public ethics and reputational risk (INTOSAI, 2001). COSO Enterprise Risk Management (2004) adopts a three-

dimensional approach encompassing objectives, corporate governance structure, and risk management; it emphasizes that risks are not only uncertainties and threats but also opportunities (COSO, 2004). ISO Risk Management—Principles and Guidelines also state that effective risk management adds value to organizations (Özbek, 2012). While these traditional, enterprise risk management-focused guides made significant contributions in their early years, they have fallen short in predicting changes in risk structures in the face of recent global developments (Kıral, 2018). Accordingly, the 2009 version of ISO 31000 was revised in 2018 (ISO, 2018), stating that risks can vary depending on context and should be relevant to all strategic policies (Uysal, 2020). Similarly, the COSO framework, published in 2017 under the title "Enterprise Risk Management - Integration with Strategy and Performance," emphasizes the need to establish strong connections between strategic management and risk management (COSO, 2017). In order for these frameworks to provide the expected benefits and integrate risk management with strategic management, some implementation steps are required: embedding enterprise risk management in the organizational culture (Anderson and Frigo, 2020), embedding it in all management and decision-making processes (COSO, 2017), quantifying its contributions (Nayak and Akkiraju, 2012), appointing units and personnel responsible for risk, ensuring employee participation in the process through training and workshops, utilizing strategic communication and strategic management tools (Soner and Karabacak, 2023), and using technological capabilities such as artificial intelligence in enterprise risk management processes (COSO, 2017).

Menekşe DeresiToday, as a natural consequence of this evolution, risk and strategy are no longer considered distinct processes, but rather intertwined ones. It is precisely at this intersection that artificial intelligence acquires a new function of generating and transferring knowledge; it is no longer merely a process-accelerating technology but rather a cognitive element that reshapes strategic thinking and risk perception (Nedelko et al., 2015; Rigby & Bilodeau, 2017). The speed and accuracy advantages of artificial intelligence applications significantly contribute to the effectiveness of strategic management processes (Borges et al., 2021; Soner & Karabacak, 2023). Therefore, it has become clear that academic interest in the relationship between strategic management and artificial intelligence is rapidly increasing (WOS, 2025; Scopus, 2025).

Menekşe DeresiDespite growing interest, there's no consensus on the benefits and drawbacks that artificial intelligence will bring to our lives. Academic studies are generally categorized into optimistic (positive contributions to the future) and pessimistic (negative impacts) perspectives (Ünal & Kılınç, 2020). Key points highlighted in assessments of the AI-risk management relationship include:

• **Disadvantages:** Privacy and data security risks due to information security breaches (Kurter, 2025; Zhao, 2024); misuse of business processes if not properly programmed and monitored (Mahato, 2022); possibility of making decisions contrary to ethical and moral principles (Prorok & Takács, 2024); difficulty in accessing large data sets required for analysis (Zhao, 2024); need for corporate culture, training and technical competence for effective use (Comite et al., 2025).

• **Benefits:** Predicting risks by quickly analyzing big data (Comite et al., 2025), supporting risk assessment (Berberoğlugil, 2023) and risk reduction/opportunity capture processes (Prorok & Takács, 2024); eliminating time-consuming steps in business processes (Kurter, 2025); producing reliable solutions for complex problems (Mahato, 2022); improving service quality and customer satisfaction (Borges et al., 2021; Berberoğlugil, 2023); gaining proactive capacity against financial/operational/ environmental risks (Comite et al., 2025); facilitating the evaluation of strategic decisions in scenario analyses and improving resource utilization (Prorok & Takács, 2024); deep learning, content generation, review, high-speed analysis on big data (Ünal & Kılınç, 2020; Prorok & Takács, 2024) and cost and time savings (Comite et al., 2025; Berberoğlugil, 2023).

Menekşe DeresiDespite all these benefits and drawbacks, it should be accepted that artificial intelligence is inevitable in the future; adaptation efforts should be focused instead of resistance (Fuhrman & Mooney, 2021). In this context, to mitigate potential drawbacks and leverage the capabilities of AI, it is necessary:

- ✓ Ethical priorities and boundaries should be determined globally across all scientific fields (Ünal & Kılınç, 2020).
- ✓ Risk levels should be defined for tasks and processes; the principle of human superiority should be preserved in human-AI interactions (Köse, 2018).
- ✓ Employees should be trained in AI literacy; AI outputs should be subject to scientific testing before being used directly (Fuhrman & Mooney, 2021; IESE, 2018).
- ✓ Strategic decisions should be made by humans or subject to human oversight (Borges et al., 2021).
- ✓ Questions posed to AI in areas such as risk management should be specific and open-ended; responses should be justified and compared with those from different applications (Lengyel et al., 2024).

Menekşe DeresiStudies in the literature demonstrate that AI applications, particularly as decision support systems, offer significant contributions to risk

management processes. However, the relationship between AI and enterprise risk management has been studied to a limited extent (Borges et al., 2021; Tircovnicu & Hategan, 2023). The reviewed studies indicate that AI applications mostly focus on the areas of finance, information security, and corporate security, and that the relationships are mostly established from the author's perspective and at the technical level. For example, Zhao (2024) used code-based AI applications in a financial risk prediction model. Qi et al. (2024) compared traditional methods for managing information security risks with AI-generated data. Sang and Najihah (2023) examined the functional requirements for an enterprise security management information system and the potential use of AI in system analysis.

Menekşe DeresiIn light of the information presented above, it is anticipated that the fundamental transformation that will shape the future of management science will progress through hybrid decision mechanisms in which human and artificial intelligence systems work together. The aim of this study is to contribute to the integration of strategic management and risk management approaches and to determine the role that artificial intelligence applications can play as a strategic management tool in this process. It is evaluated that the study results will provide a visible framework by introducing a new area of discussion into the role of artificial intelligence in corporate risk-strategy relationships and management science. In addition, the study will not only contribute to the existing literature but will also provide a theoretical basis for future experimental, comparative and applied research.

2. Methodology

2.1. Research Design

This study was designed as a qualitative research project aiming to conceptually explore the potential role of artificial intelligence (AI) in the integration of risk management and strategic management. The data were obtained by posing researcher-developed questions to various AI applications using a semi-structured interview technique. The responses provided by these applications were analyzed through the theoretical thematic analysis method. This approach allows for the systematic examination of data within a predetermined theoretical framework (Braun & Clarke, 2006). Theoretical thematic analysis is not merely descriptive but also interpretive and conceptual in nature, enabling an evaluation of the position of AI applications within management science at a theoretical level. The COSO 2017 Enterprise Risk Management (ERM) Framework served as both the theoretical reference point and the main coding axis for the analysis. Thus, COSO 2017 constituted the structural foundation for the study’s theoretical thematization.

2.2. Population and Sample

According to analyses of global information systems, there are more than 10,500 artificial intelligence applications worldwide, encompassing proprietary, local, and enterprise models. However, only a handful of them are widely recognized and used across both academic and professional domains (Onelittleweb, 2025).

Menekşe DeresiFor this study, the AI applications ChatGPT, Bing.AI, Gemini.AI, and DeepSeek were selected as the sample. These were chosen because they are publicly accessible, widely used in academic and professional contexts, and offer free access to data. Moreover, their differing infrastructures and algorithmic architectures provided an opportunity to observe and compare diverse perspectives on management-related phenomena (Donanım, 2024; Innova, 2023).

2.3. Data Collection Process

The data collection process was conducted through semi-structured interviews, a method that allows researchers to maintain flexibility within a predefined set of questions and to elicit more comprehensive and original responses from participants (in this case, AI applications) (Akman & Erişen, 2022; Şencan, 2005).

Menekşe DeresiBased on the COSO 2017 framework, the researchers developed seven open-ended questions:

1.Menekşe DeresiCan artificial intelligence applications be defined as a new strategic management tool?

2.Menekşe DeresiIs there a relationship between artificial intelligence applications and the enterprise risk management approach?

3.Menekşe DeresiTheoretically, how can artificial intelligence applications contribute to the “Governance and Culture” component of the COSO 2017 ERM Framework?

4.Menekşe DeresiTheoretically, how can artificial intelligence applications contribute to the “Strategy and Objective Setting” component of the COSO 2017 ERM Framework?

5.Menekşe DeresiTheoretically, how can artificial intelligence applications contribute to the “Performance” component of the COSO 2017 ERM Framework?

6.Menekşe DeresiTheoretically, how can artificial intelligence applications contribute to the “Review and Revision” component of the COSO 2017 ERM Framework?

7.Menekşe DeresiTheoretically, how can artificial intelligence applications contribute to the “Information, Communication, and Reporting” component of the COSO 2017 ERM Framework?

Menekşe DeresiEach question was directed separately to all four AI applications. The responses were recorded in their raw form, without any linguistic or contextual modification. This ensured that the unique expression styles of the AI systems were preserved, allowing for the examination of how they conceptualize corporate governance processes.

The data collection process included the following steps:

- ✓ Structuring the questions according to the COSO 2017 framework.
- ✓ Administering the questions to each AI model in an online environment.
- ✓ Recording the responses in their original form.
- ✓ Transferring the raw responses into NVivo for qualitative data analysis.

2.4. Data Analysis

The collected data were analyzed using the theoretical thematic analysis approach. The purpose of this method is to identify patterns, similarities, and differences within the data based on a specific theoretical framework—in this case, the COSO 2017 ERM Framework. This framework served as both the theoretical reference and the structural foundation for the thematic coding process. Accordingly, the responses of AI applications were analyzed in the context of the components of enterprise risk management, and their positions within the integration of risk and strategy were conceptually interpreted.

Menekşe DeresiThe analysis process followed the five-step structure proposed by Braun and Clarke (2006):

1.Menekşe DeresiFamiliarization with the Data: Reading the raw responses multiple times to establish a general understanding of their meaning.

2.Menekşe DeresiGenerating Initial Codes: Identifying key concepts associated with the five components of COSO 2017.

3.Menekşe DeresiConstructing Themes: Grouping similar meaning clusters to form coherent themes.

4.Menekşe DeresiReviewing Themes: Evaluating conceptual overlaps to ensure theoretical integrity among themes.

5.Menekşe DeresiInterpreting Themes: Explaining how each theme reflects the theoretical positioning of AI within the context of enterprise risk management.

2.5. Reliability and Validity

In qualitative research, reliability and validity are achieved through transparency in research procedures and the consistency of findings with the data (Başkale, 2016; Arslan, 2022).In this study, reliability was ensured through four key principles:

•**Menekşe DeresiCredibility:** The coding process was documented step-by-step based on the collected responses, and the analytical structure was explicitly aligned with COSO 2017 components.

•**Menekşe DeresiTransferability:** The methods and analytical steps were described in detail, creating a replicable model for similar studies.

•Menekşe Deresi**Dependability:** Data were collected from multiple AI systems, adopting a multi-source data approach.

•Menekşe Deresi**Confirmability:** Findings were derived directly from raw data, and interpretations were constructed based on data-driven evidence.

Menekşe DeresiFurthermore, intercoder reliability between two independent researchers was calculated as 85% agreement (Cohen's Kappa = 0.81), which supports the robustness of the analytical process.

3. Results

In this section, the themes, subthemes, and representative quotations derived from the theoretical thematic analysis of the data obtained from artificial intelligence applications (ChatGPT, Bing.AI, Gemini.AI, and DeepSeek) are presented. As a result of the analysis, the responses provided by the AI applications to the research questions were categorized under five main themes.

Theme-1: Governance and Culture

Artificial intelligence describes its contribution to governance and corporate culture as a "data-driven integrity provider." Applications have demonstrated that concepts such as transparency, accountability, and ethical compliance within organizations can now be supported not only by human behavior but also by data-driven systems.

Menekşe DeresiArtificial intelligence can increase organizational risk awareness by continuously collecting data on employee behavior, performance

trends, and corporate communication patterns. This allows managers to detect potential ethical violations or organizational weaknesses early.

Menekşe DeresiIn this respect, AI can be considered not only a technical analysis tool but also a "silent observer of corporate ethics and governance culture." This approach allows corporate culture to evolve into a dynamic structure fueled by data.

Menekşe DeresiThe coding process related to the theme “Governance and Culture” is presented in Table 1.

Table 1: Coding Process for the Theme “Governance and Culture”

Code	**Subtheme**	**Main Theme**
Monitoring ethical compliance	Ethical behavior and accountability	Governance and Culture
Reducing bias through automation	Data-based ethical supervision	
Organizational behavior analysis	Behavioral analysis and cultural awareness	
Transparency and accountability	Transparency culture	
Sentiment analysis for risk culture	Risk awareness culture	

Menekşe DeresiThe representative responses of AI applications regarding this theme suggest that artificial intelligence supports an ethical and transparent governance culture and functions as a proactive monitoring tool:

•**Menekşe DeresiChatGPT:** “AI applications contribute to the formation of behaviors based on system integrity, transparency, and risk awareness across the organization.”

•**Menekşe DeresiBing.AI:** “Artificial intelligence reshapes corporate governance through automation, predictive analytics, and ethical oversight.”

•**Menekşe DeresiGemini.AI:** “AI can analyze internal communications and performance records to identify cultural indicators consistent or inconsistent with risk management principles.”

•Menekşe Deresi**DeepSeek:** “Machine learning models can detect behavioral anomalies that signal unethical conduct or a weak risk culture.”

Theme-2: Strategy and Objective Setting

The second theme highlights the role that AI plays in strategy-making processes. All four AI applications emphasized that AI's "forecasting" and "scenario planning" capabilities have become decisive in determining the strategic direction of organizations.

Menekşe DeresiThrough machine learning, natural language processing, and big data analytics, AI can generate probabilistic future scenarios by scanning both internal and external environmental factors. These scenarios help organizations develop balanced, data-driven strategies aligned with their risk appetite.

Menekşe DeresiIn this sense, AI not only performs analysis but also assumes the role of a "predictive strategy architect" in the strategic management process. AI's simulation-based insights have become a critical support mechanism for managers, particularly in resource allocation, performance targets, and long-term vision formulation.

Menekşe DeresiThe coding process related to the theme “Strategy and Objective Setting” is presented in Table 2.

Table 2: Coding Process for the Theme “Strategy and Objective Setting”

Code	Subtheme	Main Theme
Scenario modeling	Probability-based scenario analysis	Strategy and Objective Setting
Predictive analytics for decision-making	Data-driven strategic foresight	
Risk–return optimization	Risk–return balance	
Alignment with risk appetite	Strategic alignment	
Dynamic modeling	Adaptive decision-making	

Menekşe DeresiThe representative responses show that AI enhances flexibility and resilience in strategic management through predictive analytics:

•Menekşe Deresi**ChatGPT:** “AI enables data-driven strategic decisions aligned with an organization’s risk appetite and long-term value creation goals.”

•Menekşe Deresi**Bing.AI:** “AI-powered systems analyze large datasets to identify emerging trends, quantify uncertainties, and develop risk-oriented strategic choices.”

•Menekşe Deresi**Gemini.AI:** “AI algorithms model different strategic scenarios, anticipate potential risks associated with each option, and strengthen the resilience of strategic objectives.”

•Menekşe Deresi**DeepSeek:** “AI supports the development of adaptive strategies that remain aligned with strategic goals through real-time risk-adjusted decision-making.”

Theme-3: Performance Management

This theme focuses on the function of AI in the "performance" domain, the third component of the COSO-2017 Enterprise Risk Management Framework. AI has the capacity to monitor organizations' performance and risk indicators in real time.

Menekşe DeresiResponses from applications demonstrate that AI can detect deviations early through predictive analytics and enable organizations to take proactive action. This represents a shift to a management model where risks are not only "detected" but also "anticipated."

Menekşe DeresiFor example, Gemini.AI stated that AI supports "dynamic decision-making processes" by integrating risk and performance data. Such systems go beyond traditional performance measurement and generate strategic feedback based on instantaneous data.

Menekşe DeresiAs a result, AI has become not just a measurement tool in performance management, but also a "digital component of organizational reflexes."

Menekşe DeresiThe coding process related to the theme “Performance Management” is presented in Table 3.

Table 3: Coding Process for the Theme “Performance Management”

Code	Subtheme	Main Theme
Real-time monitoring	Instant performance tracking	Performance Management
Key risk indicators	Risk performance metrics	
Anomaly detection	Deviation analysis and early warning	
KPI–KRI integration	Performance–risk integration	
Automated evaluation reporting	Automated performance reporting	

Menekşe DeresiThe representative responses indicate that AI transforms performance assessment from a static into a dynamic, data-driven process:

•Menekşe Deresi**ChatGPT:** "AI integrates risk and performance data to provide a holistic perspective on organizational effectiveness."

•Menekşe Deresi**Bing.AI:** "AI-supported analytics enable continuous evaluation of performance by processing large datasets."

•Menekşe Deresi**Gemini.AI:** "AI algorithms predict the likelihood and impact of risks with higher precision, enabling the development of more effective risk response strategies."

•Menekşe Deresi**DeepSeek:** "AI ensures dynamic performance management aligned with strategic objectives through real-time risk monitoring and predictive performance analytics."

Theme-4: Continuous Learning and Adaptation

One of the most significant contributions of AI is its ability to strengthen organizations' learning and adaptability. The analyzed responses demonstrate that AI can evaluate the effectiveness of risk management policies by continuously learning from past data. This theme aligns with organizational learning theory. AI can improve future decision-making processes by drawing inferences from past mistakes or examples of success. This contributes to the organization's transformation into a structure that not only identifies risks but also "learns through risk."

Menekşe DeresiDeepSeek and Bing.AI stated that AI establishes a "cyclical learning mechanism" to continuously test the effectiveness of strategies and policies. This feature directly aligns with the "Review and Revision" component of COSO-2017.

Menekşe DeresiThe coding process related to the theme "Continuous Learning and Adaptation" is presented in Table 4.

Table 4: Coding Process for the Theme "Continuous Learning and Adaptation"

Code	**Subtheme**	**Main Theme**
Continuous learning cycle	Continuous learning and adaptation	Continuous Learning and Adaptation
Feedback-based improvements	Feedback-oriented development	
Adaptive risk assessment	Dynamic risk assessment	
Model improvement via machine learning	Data-driven model updating	
Automated compliance checks	Continuous auditing and control	

Menekşe DeresiRepresentative responses emphasize AI's contribution to strengthening organizational learning loops and automating revision processes:

•Menekşe Deresi**ChatGPT:** "AI supports continuous learning and adaptive risk management processes from the perspective of organizational learning and cybernetic systems."

•**Menekşe DeresiBing.AI:** "Machine learning algorithms continuously refine risk management models by identifying emerging patterns."

•Menekşe Deresi**Gemini.AI:** "AI analyzes risk events and control effectiveness data to identify areas requiring timely revision."

•Menekşe Deresi**DeepSeek:** "AI systems automate continuous improvement cycles through advanced analytics and adaptive learning, enhancing organizational agility."

Theme-5: Intelligent Automation

The final theme concerns the role of AI in information management, communication, and reporting processes. AI, particularly through natural language processing and natural language generation techniques, can simplify complex data and report it appropriately to different stakeholders. This reduces information asymmetry and increases corporate transparency. Automatic reports generated by AI enable decision-makers to access information quickly and accurately, thus strengthening the flow of information between the board and operational units.

Menekşe DeresiBing.AI and ChatGPT applications have defined this feature as an "intelligent communication bridge." This role of AI in information management not only increases efficiency but also contributes to the establishment of risk awareness at the corporate level.

Menekşe DeresiThe coding process related to the theme "Intelligent Automation" is presented in Table 5.

Table 5: Coding Process for the Theme "Intelligent Automation"

Code	Subtheme	Main Theme
Automated risk reporting	Automated information sharing	Intelligent Automation
Natural language generation	Clear report creation	
Data synthesis and integration	Data unification and analysis	
Sentiment and stakeholder analysis	Stakeholder communication and feedback	
Transparency and timeliness	Transparent and timely information flow	

Menekşe DeresiThe representative responses show that AI can enhance transparency and participation by facilitating two-way communication and intelligent reporting systems:

•**Menekşe DeresiChatGPT:** "AI improves the quality, timing, and relevance of risk-related information flows, supporting transparent and informed decision-making."

•Menekşe Deresi**Bing.AI:** "Natural language processing tools summarize complex reports to ensure clear and accessible communication."

•Menekşe Deresi**Gemini.AI:** "AI generates comprehensive and timely risk reports, ensuring that accurate information reaches the right stakeholders."

•Menekşe Deresi**DeepSeek:** "AI transforms static reporting into interactive and adaptive processes, enhancing risk transparency and strategic alignment."

Thematic Evaluation

The overall results of the thematic analysis demonstrate that artificial intelligence acts as a holistic actor within the COSO 2017 Enterprise Risk Management Framework (see Figure 1).

Figure 1: Theoretical Theme Map

Menekşe DeresiAI supports governance culture, shapes strategic objectives, monitors performance, learns continuously, and enhances reporting mechanisms. Thus, AI is not merely a technological innovation but has evolved into the

strategic backbone of organizational decision-making systems. All four applications consistently emphasized that AI has begun to assume the role of a “strategic partner” or “governance facilitator” in contemporary organizations.

4. Discussion

This study analyzed the role of emerging AI applications at the intersection of the disciplines of enterprise risk management and strategic management, directly using outputs derived from these systems. The findings demonstrate that AI is more than just a technical tool supporting operational processes; it also plays a transformative role in strategic management, performance monitoring, continuous learning, and reporting mechanisms. In this context, the research has yielded theoretical implications that call for rethinking the current position of AI in management science.

Menekşe DeresiIn this section, the findings obtained from the research are discussed in line with the relevant literature and theoretical framework; the meanings regarding the position of artificial intelligence between risk management and strategic management disciplines are interpreted.

4.1. Integration of Artificial Intelligence into Management Disciplines

The definition of AI applications as a "modern strategic management tool" demonstrates a fundamental transformation of the paradigm that has shaped the tool-centric nature of management science for many years. While traditional strategic management tools—benchmarking, balanced scorecard, TQM, reengineering models, or customer-centric segmentation approaches—provide managers with support that remains largely analytical, AI systems have become not merely technical tools providing information for decision-making processes but also active management components that interpret data, recognize patterns, generate predictive outcomes, generate alternative scenarios under uncertainty, and provide real-time feedback on organizational behavior. This transformation is directly consistent with the findings of Nedelko and colleagues (2015) that "management tools adapt to changes in the technological and institutional environment like evolving organisms." This study examined the use of 25 different management tools by managers in Slovenia and Croatia, and found that the use of management tools, particularly in transition economies, is constantly reshaped in parallel with technological innovations and institutional needs. Menekşe DeresiThe most striking finding of the study is that current use strongly predicts future intentions. This suggests that the adoption of a management tool in organizations is shaped not only by its technical benefits but also by managers' experiential relationship with the tool. At this very point, AI applications constitute a new stage in the natural evolution of management tools: Unlike traditional tools, they not only support the process but also offer a dynamic

learning structure that influences the organization's strategic direction, processes environmental signals, and expands its foresight capacity. Thus, AI is evolving from being a passive element of the management tools ecosystem into a decisive strategic actor transforming the corporate decision-making architecture.

Menekşe DeresiThe study's findings revealed that AI plays a decisive role not only in operational processes such as risk prediction or performance monitoring, but also in more abstract, organizational-level areas such as governance, culture, and strategy formulation. This closely aligns with the framework emphasized by Fraser and Simkins (2016) in the enterprise risk management literature. Fraser and Simkins demonstrate, through a detailed case study of Hydro One, that for enterprise risk management to be successful, the risk management function must have sufficient authority and independence, risk must be systematically integrated into all critical decision processes, and risk awareness must be made a natural component of the corporate culture. Designing enterprise risk management in this way creates a governance infrastructure that generates continuous feedback and encourages learning within the organization. Similarly, Mahato (2022) defines AI as a cognitive system that mimics human thinking and learning processes, analyzes complex data, supports decision-making processes through risk assessment models, predictive analyses, and increased diagnostic accuracy. He emphasizes that it strengthens risk assessment, workflow efficiency, and foresight capacity in areas such as healthcare, manufacturing, and security. When these two approaches are considered together, it is possible to argue that the findings in our study position AI not merely as a technical automation tool, but as a strategic management infrastructure that strengthens the link between risk management, governance, and strategy, and accelerates organizational learning cycles by transferring risk information to different levels of the organization. Thus, artificial intelligence functions as a dynamic learning mechanism that supports the risk culture and management structures envisaged by corporate risk management, detects new risk signals, records them in corporate memory and triggers strategy updates.

Menekşe DeresiWithin the COSO 2017 Enterprise Risk Management (ERM) Framework, AI interacts with all five components:

•Menekşe Deresi**Governance and Culture:** AI supports ethical behavior, accountability, and transparency through data-driven insights.

•Menekşe Deresi**Strategy and Objective Setting:** Machine learning–based foresight makes strategic planning more objective and evidence-based.

•Menekşe Deresi**Performance:** AI contributes to the early detection of risks and strengthens proactive decision-making mechanisms.

•Menekşe Deresi**Review and Revision:** Continuous learning and adaptive capabilities enhance organizational resilience.

•Menekşe Deresi**Information, Communication, and Reporting:** AI facilitates faster and more reliable information flows, improving managerial awareness.

Menekşe DeresiThis interaction structure demonstrates that AI transforms risk management from a reactive control mechanism into a proactive strategic partner that helps shape organizational direction.

Menekşe DeresiThe study demonstrated that AI establishes a multidimensional relationship with the five main components of the COSO-2017 framework. The structure of the interaction can be broadly categorized as shown in Table 6:

Table 6: Contribution Profile of Artificial Intelligence in the Context of COSO-2017 Components

COSO Components	Contribution of AI	Teorik Sonuç
Governance & Culture	Ethical violation detection, communication analysis, corporate behavior mining	The partial transfer of governance from humans to machines
Strategy & Objective Setting	Scenario generation, uncertainty simulation, risk appetite mapping	Strategy is no longer solely based on human intelligence
Performance	Real-time monitoring of key risk indicators (KRIs)/key performance indicators (KPIs)	Performance management is becoming fluid, not static
Review & Revision	Machine learning-based feedback loop	The organization is rapidly transforming into a learning organism
Information & Reporting	Automatic report generation, summarizing the basics of natural language processing (NLP)	Information now reaches the manager in an interpreted form

4.2. Artificial Intelligence and the New Dimension of Strategic Transformation

The themes emerging from the research clearly demonstrate the potential of AI in "strategic foresight generation." AI, through its capacity to interpret large data sets, generate probability-based scenarios, and simulate different risk-opportunity configurations, facilitates decision-making under uncertainty and serves as a "foresight infrastructure" that increases organizations' strategic resilience. This finding is consistent with the positioning of strategic management

tools as a backbone integrating enterprise risk management and strategic management in the Strategic Management Tools-Based Enterprise Risk Management (SYAD-ERM) Model, developed within the framework of the COSO ERM 2017 Framework (Soner & Karabacak, 2023). The aim of this study is to concretize the extent and how institutions use strategic management tools, how integrated this use is with risk management, and the resulting maturity level through an index (SYAD-KRY Index); the proposed model and index provide a self-assessment framework that relates institutional risk management maturity to strategic foresight and opportunity generation capacity. Similarly, Rigby and Bilodeau's global management tools and trends study, conducted with a repetitive survey design among 1,268 executives, tracks the use of digital tools such as advanced analytics, the Internet of Things, and agile management. The findings indicate that digital transformation is accelerating the shift from hierarchical structures to a team-based, adaptable, and rapidly adaptable "technology-enabled strategic agility." From this perspective, the ability of AI applications to transform big data into scenario-based strategic insights not only deepens the risk-strategy integration established through strategic management tools emphasized in Soner and Karabacak's maturity index approach, but also takes the technology-driven agility logic proposed by Rigby and Bilodeau to a new level, enabling organizations to build dynamic, learning, and proactive decision-making structures. In other words, AI is not merely a tool that provides efficiency; it is a transformative factor that plays a role in redefining strategic orientations and risk appetite. Furthermore, the impact of AI on strategic planning aligns with the concept of the "learning organization," which is increasingly prominent in management literature. The emphasis on continuous learning and adaptation seen in the responses of DeepSeek and Bing.AI recalls the fundamental principles of Cybernetic Systems Theory (feedback). From this perspective, AI provides organizations not only with data but also with a way of thinking, contributing to the formation of a "digital reflex" in management processes.

4.3. The Theoretical Transformative Role of AI in Enterprise Risk Management

Artificial intelligence expands the functional boundaries of enterprise risk management, turning it into a bridge mechanism that integrates risk management with strategic management. This finding directly corresponds with COSO 2017’s emphasis on “the integration of risk with strategy and performance.”

Menekşe DeresiArtificial intelligence has evolved into a decision-support infrastructure capable of not only identifying risks but also analyzing how they relate to corporate objectives, risk appetite, and value creation goals. Through big data analytics, pattern recognition, and predictive modeling techniques, AI makes it clear which strategic objectives a given risk threatens, which opportunity areas

it intersects with, and the potential impacts of different risk scenarios on corporate performance. Thus, the risk management process is moving beyond a mere assurance mechanism centered on control and auditing, as emphasized by Anderson and Frigo (2020) in their guide "Creating and Protecting Value: Understanding and Implementing Enterprise Risk Management," developed for COSO, and is becoming a value-creation process integrated into the preliminary stages of strategic planning. In this guide, the authors state that the aim is to manage risks from both a value creation and value preservation perspective by integrating enterprise risk management into the organization's strategy formulation, goal setting, and performance management cycles. They position risk management not as a standalone, "sideline" function, but as a business model component that permeates all processes. They argue that enterprise risk management cannot truly create value when conducted separately from core processes such as strategic planning, investment decisions, and change management; therefore, a clear link must be established between risk appetite, strategic objectives, and performance indicators. At this point, AI-based risk analytics provides a dynamic framework that links risks to corporate strategy, providing strong theoretical and practical support for Anderson and Frigo's "value creation-oriented risk management" approach: risk management becomes an integrated value architecture that serves not only to prevent losses but also to design strategic objectives in a more informed, data-driven and proactive manner.

Menekşe DeresiIn this context, AI's contribution is twofold:

1.Menekşe DeresiAnalytical Contribution: It establishes causal relationships within complex datasets, enabling early risk detection.

2.Menekşe Deresi**Conceptual Contribution:** It transforms risk perception from a static structure into a dynamic system where the organization functions as a continuously learning and adaptive entity.

Menekşe DeresiTherefore, AI elevates enterprise risk management from a protective mechanism to a core component of strategic thinking and value creation. This shift redefines the nature of managerial decision-making by embedding analytical intelligence directly into strategic processes.

4.4. Limitations and Directions for Future Research

The study is limited to responses obtained from four publicly accessible and widely recognized AI applications. Future research could broaden this scope by including AI models with distinct algorithmic architectures—such as proprietary corporate AI systems or sector-specific applications—to enhance generalizability. Moreover, as this study was conducted at a theoretical level, future empirical research could collect quantitative or mixed-method data to measure the concrete impact of AI applications on organizational risk

management and strategic decision-making. Cross-country comparative studies could also examine cultural differences in AI-driven management practices, contributing to an understanding of whether AI functions as a universal or context-specific managerial tool. Additionally, as AI becomes increasingly embedded in decision-making processes, there is a growing need for deeper research on ethical responsibility, data privacy, and algorithmic accountability. Integrating quantitative methods, such as models measuring the relationship between AI utilization and corporate performance, would further enrich the understanding of AI's transformative role in management science.

4.5. Original Contribution to the Literature

This study generates innovation at three distinct levels:

Theoretical Contribution: Artificial intelligence (AI) is modeled for the first time as an active actor within strategic risk management.

Methodological Innovation: AI systems were directly queried, and their responses were interpreted through thematic analysis.

Governance Perspective: A new paradigm is proposed in which decision-making processes partially shift from human agents to machine intelligence.

Menekşe DeresiA particularly notable aspect of originality lies in the methodological approach: while the majority of existing studies treat AI as an input–output mechanism or a passive analytical object, this research elevates AI to the level of an epistemic subject. By examining how AI itself conceptualizes core elements of risk governance, the study offers a fundamentally new lens for understanding the evolving human–machine relationship in strategic risk management.

5. Conclusion

This study used thematic analysis to examine the theoretical role of AI in integrating the disciplines of risk management and strategic management. The research's unique approach is to directly assess the position of AI applications (ChatGPT, Bing.AI, Gemini.AI, DeepSeek) within the enterprise risk management framework based on their own responses.

Menekşe DeresiThe findings demonstrate that AI functions not only as an operational decision-support tool but also as a strategic partner and catalyst for organizational transformation. AI's self-description as a "modern strategic management tool" demonstrates that the role of technology in management sciences has reached a formative, not merely supportive, level.

Menekşe DeresiThe study reached the following key conclusions:

•Menekşe DeresiArtificial intelligence represents a new phase in the evolution of strategic management tools. Strategic management processes are now supported by data-driven, predictive, and continuously learning systems, moving beyond traditional tools. This demonstrates that the management approach is being redefined with artificial intelligence.

•Menekşe DeresiThe enterprise risk management framework is being deepened by AI. AI contributes to each of the five components of ERM (governance, strategy, performance, review, and communication) at different levels. The effectiveness of AI has increased significantly, particularly in strategy formulation, performance monitoring, and information management processes.

•Menekşe DeresiArtificial intelligence is evolving from a reactive tool to a proactive actor in risk management. Artificial intelligence can be considered a system that not only analyzes risks but also anticipates changes in the risk environment and develops strategic adaptation mechanisms. This increases the resilience of institutions in the face of uncertainty.

•Menekşe DeresiArtificial intelligence strengthens organizational adaptation by accelerating institutional learning. The study defines AI as an element that contributes to institutions becoming self-renewing systems through continuous data analysis and feedback loops.

•Menekşe DeresiThe integration of AI and management also re-emerges with the issue of ethics and governance. The inclusion of AI in decision-making processes creates new risks in the areas of data security, algorithmic transparency, and accountability. Therefore, strengthening ethical principles and oversight mechanisms in AI-based management systems is essential.

Menekşe DeresiThis study has made three theoretical contributions to the literature:

- ✓ The position of artificial intelligence within management science has been subjectivized. In this context, evaluating the responses of artificial intelligence from its own perspective represents an epistemological approach often overlooked in management literature. This method provides a new perspective that considers technology not merely as a tool but as a "thinking system."
- ✓ It established a new theoretical link by linking the COSO-2017 Enterprise Risk Management model to artificial intelligence. This conceptually explains how artificial intelligence contributes to abstract concepts in risk management (governance culture, strategic alignment, learning cycle, etc.).

- ✓ Demonstrated the transformative impact of artificial intelligence in the digitalization of strategic management tools. This study positions artificial intelligence as a "meta-management system" rather than a "tool" among management tools.

Menekşe DeresiThe research findings provide several implications for managers and organizations. The use of AI-supported systems in decision-making processes can accelerate strategic planning and reduce errors. Real-time performance monitoring and risk prediction systems can increase organizations' resilience to uncertainty. Intelligent automation in information and reporting processes can reduce the time it takes for decision-makers to access information, increasing managerial efficiency. Strengthening corporate ethics policies and audit structures will be a critical requirement for managing AI-related risks. However, while adopting these processes, organizations must simultaneously develop not only technological investments but also cultural and managerial transformation strategies.

Menekşe DeresiIn conclusion, this study demonstrates that artificial intelligence is not merely a technological innovation in corporate governance, but a new management paradigm. By deepening the interaction between risk management and strategic management, artificial intelligence provides institutions with both foresight and adaptability. In this respect, artificial intelligence represents a turning point in the corporate governance literature. Future research testing this theoretical framework across different institutions, sectors, and cultural contexts will provide new insights into the digitalization of management science.

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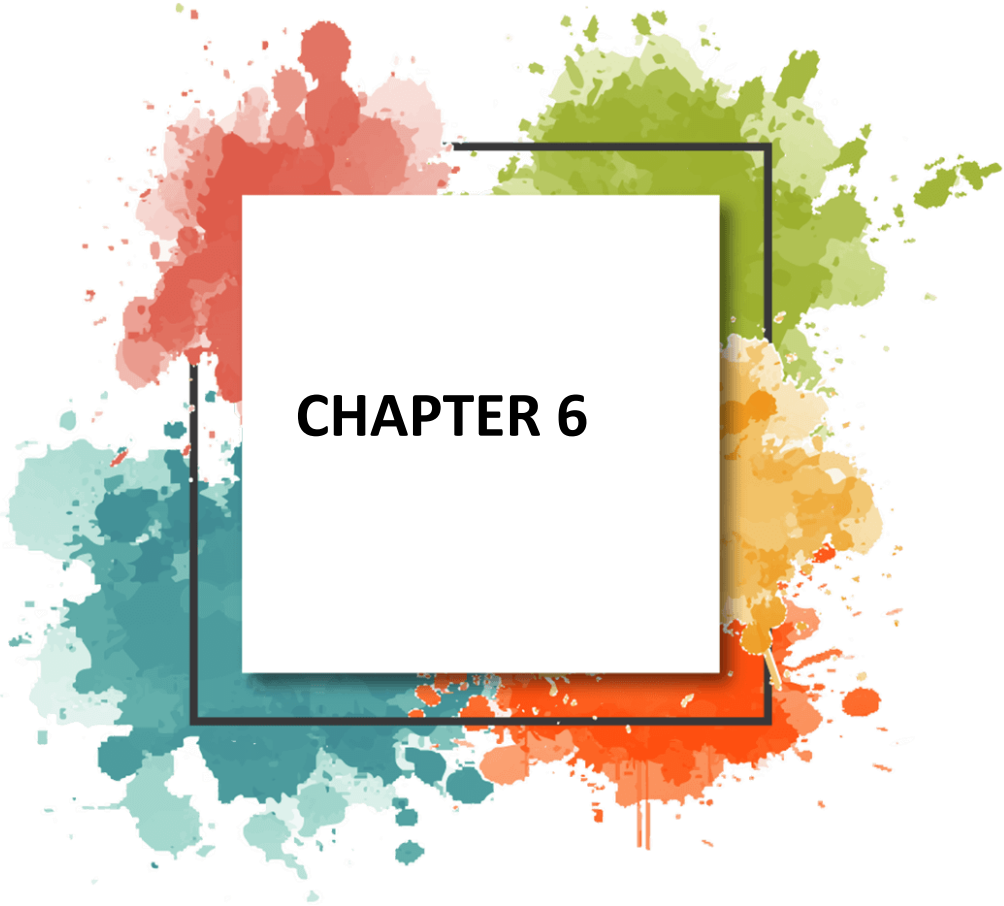
CHAPTER 6

Examples from Turkish Art of Symbolic Expression and Spatial Relationships

Betül Akgönül Yıldız[1] & Yunus Berkli[2] & Gülten Gültepe[3] & Şeyma Kurt[4]

INTRODUCTION

An icon is a visual sign that represents a specific concept, thought, or emotion, transforming an abstract meaning into a concrete image (Ayverdi, 2020). Throughout human history, symbols have functioned as one of the fundamental building blocks of cultural systems and have played a central role in the transmission of information, communication, and the production of meaning (Elliott, 2020). Therefore, especially in periods when written language was not yet widespread, societies felt the need to transmit their accumulated knowledge from generation to generation through iconographic figures, a visual language.

With the invention of writing, symbols were accepted as a universal means of communication and manifested themselves in different cultures, especially in works of art. In Turkish culture, iconographic figures, reflecting mythological beliefs and cosmological understanding in the pre-Islamic period, were decisive in the formation of cultural identity. With the acceptance of Islam, these figures were blended with the teachings of the new religion, ensuring both the preservation of traditional values and the construction of a new cultural identity. This situation is an important indicator explaining the continuity and variability of Turkish art throughout its historical process.

The fact that the ancient Turks possessed an equestrian steppe culture (Berkli, 2011), the acceptance of Islam, and their coexistence with different societies undoubtedly contributed greatly to the formation of Turkish art. Living in a very wide geographical area, the Turks carried their beliefs, culture, and art from Central Asia to the regions where they later settled. Although the figures used in Turkish artworks and spaces took on different meanings within the understanding of the new religion, they adopted in the regions they inhabited, they continued to exist (Berkli, 2007a).

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Figurative ornamentation, especially heavily used in architecture and decorative arts, emerged as a result of these interactions and created a rich symbolic universe. The intensive use of religious, plant, animal, and cosmological symbols in these ornaments reflects the complex and profound belief structure of Turkish culture, expressing its worldview in a visual language. This study examines iconographic figures that express the integrity of Turkish culture and carry its cultural codes, considering their uses in different periods and the metaphysical relationships they establish with spaces.

1. THE RELATIONSHIP BETWEEN ANIMAL FIGURES AND SPACE IN TURKISH ART

The animal style, which developed in Central Asia in the pre-Islamic period and spread across a wide geographical area, is characterized by stylized figurative ornamentation. Works using this style have been identified in a vast geographical area stretching from East Asia to East Europe, offering important clues about the art history of the region (Alsan, 2017). Iconographic figures with deep meanings are frequently used in Turkish architectural works and spaces. Among the symbols encountered in these structures and spaces, animal figures are prominent elements. The belief that some animals are sacred and possess protective qualities in the context of protection from evil is closely related to their understanding of faith. It is known that this belief continues in different geographical areas where Turks live today.

The Seljuks, who accepted Islam, extensively used some animals, which were the tribal symbols of the Oghuz Turks from whom they originated, in Anatolian architectural ornamentation (Mülayim, 1999). Animal iconography used in Turkish art is divided into two main categories: realistic animal depictions (eagle, deer, lion, horse, wolf, snake, fish) and mythological and imaginary creatures (angel, dragon, siren, griffin). Each of these figures is ichnographically meaningful and possesses a multi-layered content related to the world of beliefs and mythical narratives (İskenderzade, 2007).

Although these figures, used before Islam, were less preferred after Islam compared to plant and geometric motifs, they continued to appear in palaces, caravanserais, tombs, and religious architectural structures (Alsan, 2017). This situation shows that Islamic art has a complex structure where local and universal elements come together. Figurative motifs, influenced by local cultures, were transformed to conform to the general lines of Islamic art. In this way, artworks that both conform to religious beliefs and reflect local identity emerged.

1.1 Strength, Courage, and Victory: The Lion Motif

In Turkish architecture, the lion figure is an important symbol with deep roots. Particularly in the shamanistic beliefs of the Turks, it is among the guardian

animals protecting the tree of life, considered the axis of the world. Believed to protect shamans from evil spirits during their journeys to the sky and the underworld (Öney, 1969a), lions are also a symbol of the sun, light (S. Ögel, 1962), strength, and power. With the adoption of Islam, the lion figure became largely associated with rulers (Çoruhlu, 2006). The lion figure, frequently used in conjunction with the tree of life in Seljuk-era architecture, can be found in examples such as the Yakutiye Madrasa in Erzurum and the entrance gates of the ancient city of Ani in Kars.

Image 1: Lion Gate of Ani Ancient City (Yıldırım, 2010)

Image 2: Lion Figure in Erzurum Yakutiye Madrasa (B. A. Yıldız, 2022)

The lion figure, frequently found on Anatolian Seljuk tombstones, reflects a deep-seated belief. According to this belief, the lions on the tombstones were considered ‘guardian spirits’ that acted as protectors during the deceased’s transition to the afterlife (Öney, 1969a). This belief is evident in the lion-depicted

tombstones found in Kırşehir, Akşehir, Seyitgazi, and Tokat. In these regions, the lion figure not only carries a protective meaning but also acquires a special significance by being identified with Hz. Ali.

The lion figures placed on the tombstones of those who believed in Hz. Ali both played a protective role and were seen as intercessors for the soul of the deceased (Karamağaralı, 1972). Furthermore, in Gönül Öney's study on gravestones in Afyon, it is thought that gravestones with lions are related to the gender of the deceased, and it is estimated that the examples belong to men (Öney, 1969b).

The examination of the lion figure in Turkish architecture bears the traces of a cultural transformation. During the transition from ancient Turkish beliefs to Islam, although the symbolic meaning of the lion changed, its representation of power and protection remained. This shows that cultural changes do not always create discontinuities; on the contrary, old beliefs can be blended with new belief systems. The lion figure is one of the important examples proving that Turkish culture has a dynamic and rich structure.

The deep-rooted history and universal meanings of this symbol are the most important factors that make the lion figure popular today. It is used in many sectors such as automotive, finance, and sports to strengthen brand identities, emphasize personal expressions, and add visual richness to architectural structures. The lion, frequently featured in team emblems, jewelry, artwork, and popular culture, reinforces individuals' sense of belonging and symbolizes power and status.

1.2 Eagle Figure

The eagle figure, one of the national symbols of the Turks (Çoruhlu, 2006), is more than just an aesthetic motif; when examined in depth, it reflects a rich symbolic universe. Within the framework of the Turks' understanding of art and cultural structure, this figure has been used in many places, imbued with religious, astrological, and legal meanings (Çoruhlu, 2014). Identified with the belief in the Sky God (Görgünay, 2001), the eagle holds an important place in the Turks' cosmological thought system. Considered the ruler of the sky, a symbol of strength and power (Alsan, 2017), the eagle is also seen as part of a universal order in Turkish mythology, due to its position on the tree of life, and therefore occupies a unique place in shamanic rituals. Just like the lion, the belief that eagles or birds help shamans cross over to the other world was also held for the souls of the dead (Öney, 1969b).

Throughout history, during the Göktürk and Uyghur periods, eagles and some bird species were used as symbols of rulers and lords. The eagle figure, symbolizing the victories of rulers, is frequently depicted as victorious in animal

combat scenes. This demonstrates the eagle's association with political authority and victory (Özkul, 2019). The symbolic meanings attributed to the eagle regarding dominance, power, and strength continued in the Islamic period (Çoruhlu, 2006), and during the Karakhanid period, it became synonymous with rulership and heroism (Özkul, 2019). Although its religious significance has diminished over time, the eagle has retained its place in Turkish culture, bearing positive meanings such as good fortune and luck (Alsan, 2017).

The eagle figure, frequently encountered in Anatolian Seljuk architectural works, contains a rich set of symbolic meanings bearing traces of pre-Islamic Turkish beliefs. The eagle figure, depicted as single-headed or double-headed, has been associated with amulets and talismans, interpreted as a symbol of power and strength. It has also been the subject of symbolic uses in the context of coats of arms, totems, and tombs (Çoruhlu, 2014). The double-headed eagle, while expressing the power of two eagles, is a figure to which sacredness is attributed, considered the ancestor and protector of other birds. The use of the double-headed eagle symbol can also be seen in the Yakutiye Madrasa and the Çifte Minareli Madrasa in Erzurum.

In the Döner Kümbet in Kayseri, the eagle is depicted as a symbol of the deceased's soul ascending to heaven via the tree of life, thus associating it with beliefs about death and the afterlife (Özkul, 2019). The double-headed eagle emblem, frequently found in Turkish artifacts in Anatolia from the 11th century onwards, was also used in the Kubadabad Palace (Çaycı, 2008).

The double-headed depiction of eagles on Turkish emblems is explained by various interpretations, such as the belief that it would enhance the eagle's power. Furthermore, other birds of prey are also depicted on tombstones. The falcon-figured tombstone reliefs frequently found in Anatolia are generally used to indicate the deceased's superior hunting skills, especially their mastery of falconry (Öney, 1969b).

Image 3: Eagle Figure in Erzurum Yakutiye Madrasah (B. A. Yıldız, 2022)

The eagle's powerful and free spirit finds its place in many areas today. Used in a wide range of designs, from sports team emblems and aviation company logos to jewelry designs and architectural structures, the eagle adds strength to both corporate identities and personal expressions. It is particularly frequently chosen as a symbol of courage and victory in fields such as the military, video games, and films. In this context, the eagle figure has a deep-rooted history and holds an important place in the modern world with its universal meanings. It is preferred as an effective tool for both expressing individual identities and strengthening corporate brands.

1.3 Sheep/Ram Figures

One of the important figures used in Turkish culture is the sheep/ram, symbolizing heroism, strength, masculinity, and fertility. It is one of the animals mentioned in the Twelve Animal Turkish Calendar, and the 8th year belongs to the sheep, a year always associated with abundance and positive circumstances (Alsan, 2005). Ram and sheep heads, placed inside and on the doors of tents the first living spaces of the Turks to bring fertility, have over time become symbols used in the decoration of various places (Büyükçanga, 2006). In the door decorations of the Gök Madrasah in Sivas, a Seljuk-era structure, there are sheep figures alongside other animal figures such as lions, snakes, and dragons (S. Ögel, 1987b). Furthermore, the Sungur Bey Mosque in Niğde is another architectural example where ram/sheep figures are seen.

Sheep/ram sculptures or examples of stone carvings are seen in the tomb structures found in various geographical regions inhabited by Turks. Although these tombstones were seen in various regions of Anatolia, especially in the Eastern Anatolia Region, until recently, many have been destroyed. The sheep-ram shaped tombstone sculptures from the Erzincan region are generally depicted in an upright and heraldic posture, and this image of the sculptures has been interpreted as a protective guardian, shielding the cemetery and the deceased from potential harm (Berkli, 2007a). Furthermore, tombstone sculptures in the shape of rams were made to indicate that the person buried in that grave might have been a religious leader or a prominent figure in the region (Danık, 1990).

Image 4: A Ram Statue Tombstone in the Erzincan Museum (Berkli, 2007a)

These traditional symbols are still studied and used in various disciplines today. Artists reinterpret these figures in modern art works, expressing their respect for traditional cultural values while also making significant contributions to contemporary artistic discourse. Particularly imbued with meanings such as protection from evil and abundance, this figure continues to carry its symbolic meaning in the hands of artists, resulting in original designs in a wide range of areas from jewelry to home decor, thus ensuring the integration of traditional motifs with contemporary life. On the other hand, restoration efforts carried out by local governments and civil society organizations are of great importance in passing this cultural heritage on to future generations. In this way, the meanings carried by sheep/ram figures and the cultural and historical value of the tombstones featuring these figures are conveyed to a wider audience, thus contributing to the process of cultural awareness.

1.4 Dragon/Snake Figures

Dragon and serpent iconography are important symbols that have been imbued with different meanings in pre- and post-Islamic Turkish art and are reflected in the present day (Berkli, 2014). The dragon has been used as a figure symbolizing power and strength in Turkish culture. Dragon figures used in architectural works are thought to be a symbol that protects the structures, shields the people within them from evil, and heals their illnesses (Çoruhlu, 2014). Dragon figures were widely used in works from the Anatolian Seljuk period (Esin, 2004). The presence of this figure in many structures from this period, especially in castles, caravanserais, and hospitals (Öney, 1969c), is a manifestation of protection and healing.

Dragon figures encountered in architecture were also used in the Islamic period as a reflection of the Central Asian Turkic belief system (Çoruhlu, 2014).

The dragon symbol seen in the Double Minaret Madrasa in Erzurum is depicted alongside a double-headed eagle under the tree of life. This double dragon figure is interpreted as a symbol of hell, connected to the underworld, or as guardians protecting the tree of life. In Central Asia, among the Tungus people, the ribbons symbolizing snakes found on shamanic garments are understood to represent the beings accompanying the shaman on his journey to the underworld (Öney, 1969c).

Image 5: Dragon Figure in the Double Minaret Madrasah of Erzurum (B. A. Yıldız, 2022)

Today, these symbols have found widespread use in visual arts, fashion, design, cinema, gaming, and branding, influenced by the globalized world. Reinterpreted with new meanings that appeal to the aspirations and values of the modern individual, these symbols, especially in tattoos, express concepts such as power, freedom, and transformation. Dragons and snakes, in particular, are associated with wisdom and the ability to access ancient knowledge, and are seen as guides on an individual's inner journey. While they are frequently depicted as symbols of evil forces in mass culture, the future use of these symbols will continue to inspire new generations, shaped by technological advancements and cultural shifts.

2. THE RELATIONSHIP BETWEEN PLANT FIGURES AND SPACE IN TURKISH ART

In addition to the animal iconography frequently encountered in Turkish architectural structures, plant elements are also important symbols. The belief that trees, or certain trees, are sacred, a belief that has persisted widely among Turkish communities since ancient times, has also led to their use in Turkish art. While the birch tree is the most common in ancient Turkish culture (Çoruhlu, 2006),

pine, mulberry, oak, and poplar trees were also considered sacred, and it was believed that the Sky God could be reached through trees. With the arrival of Islam among the Turks, the sacredness of trees continued under the influence of the old belief, and cypress, olive, and date trees gained importance (Altıntaş, 1987).

Used as a symbol of fertility and productivity since prehistoric times (Öztekin, 2008), and featured in creation myths in ancient Turkic beliefs (Çoruhlu, 2006), the tree of life, described by various names such as sacred tree, universe tree, and world tree (Öztekin, 2008), has been considered a fundamental axis defining the center of the universe in Turkish and Scandinavian mythological narratives (Dağ, 2021). Furthermore, due to its numerous characteristics such as its roots descending into the earth, its branches and leaves rising towards the sky, and its self-renewal in every season, it has been regarded as a symbol representing life, the continuity of life, and eternity within the context of Turkic communities (Işık, 2004).

The tree of life, which holds an important place in Turkish architectural structures and spaces, was used in the Islamic period because it embodies the meanings of eternity, immortality, and everlastingness (Öztekin, 2008), and was depicted alone or together with a bird figure during the Anatolian Seljuk period (Öney, 1968). Furthermore, it was used as a symbol of sovereignty in the Ottoman period (Çoruhlu, 2006) on various objects and tombstones (Ağaç & Sakarya 2015). Examples have been found on tombstones in Ahlat (Öney, 1968), and on some tombstones in Kırşehir and Tokat (Mağaralı, 1972).

The Gök Medrese in Sivas, the Çifte Minareli Medrese and Yakutiye Medrese in Erzurum, and the İshak Paşa Palace are architectural examples where this figure is used. It is thought that the use of this motif in Seljuk works such as mosques, madrasas, and palaces was intended to indicate that they were important structures, and the eagle-bird compositions that appear together with the tree of life in works such as tombs and gravestones have been seen as a symbol of the transition of the souls of the dead to the other world (Öney, 1968).

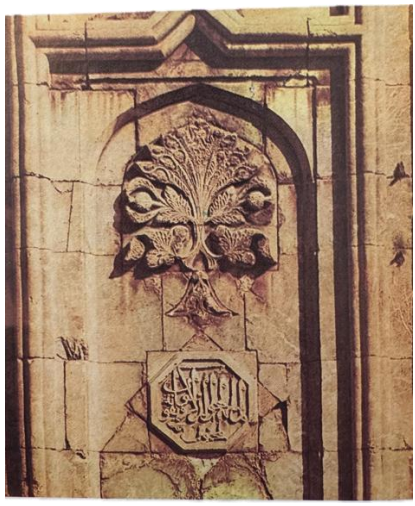

Image 6: The Tree of Life Motif Found in the Sivas Gök Medrese **(**Aslanapa, 1993**)**

In addition to the tree of life motif, stylized plant motifs were also used in the ornamentation of works belonging to Central Asian Turkic art. The tulip, a plant unique to the Central Asian steppe flora (Atak, 2020), is mentioned within the palmette group in Central Asian art due to its similar form. In the pre-Islamic Turkic belief system, tulips were used among various types and colors of flowers in different rituals (Kuru, 1997). It is known that the tulip motif was used in appliqués on felt unearthed from Hunnic burial mounds and in 8th-9th century Uyghur temple wall paintings (Atak, 2020).

Like other forms used before Islam, the tulip motif continued to be used in Turkic art after the acceptance of Islam, acquiring different meanings. Because the word "tulip" can be spelled out by altering its letters, and both words have the same value according to the abjad system (Atak, 2020), it has become a frequently used decorative element in Turkish art tradition. It is used in civil architectural ornamentation, particularly in mosques, madrasas, fountains, and water dispensers, as well as on tombstones. The main gate of the Gök Medrese in Sivas, the tiles of the Rüstem Paşa Mosque, the III. Ahmed Fountain in Üsküdar, and the tombstones in the Şehzadebaşı Damad İbrahim Paşa Mosque and its surrounding cemetery are some examples of this motif.

Image 7: The Tulip Motif on the Pulpit of Rüstem Paşa Mosque (Atak, 2020)

3. THE RELATIONSHIP BETWEEN GEOMETRIC FIGURES AND SPACE IN TURKISH ART

In Turkish art, geometric compositions have become a unique decorative element as a result of the combination of accumulated geometric knowledge and imagination (Mülayim, 1982). Polygonal geometric motifs, primarily based on stars, are used extensively in Turkish architecture and are intricate geometric compositions that leave deep and sublime impressions on the human soul. Because their starting and ending points are not defined, they express divine power and infinity (Çam, 2019). These motifs, present in various periods of Turkish art, have continued their existence uninterruptedly in the Seljuk, Beylik, and Ottoman periods, applied to different materials (Mülayim, 1982).

The source of the geometric composition seen in many works in Anatolia is the Central Asian architectural ornamentation found in cities such as Bukhara and Samarkand, and these motifs were transferred to Anatolia via the Karahalids and the Iranian geographical region (Mülayim, 1982). In Anatolian Seljuk art, geometric figures were widely used in the stone ornamentation on the exteriors of buildings and in the mosaic and tile ornamentation inside the buildings.

In the 13th century, when Sufism was widespread, geometric ornamentation became the dominant decorative element in Islamic works (Ayvazoğlu, 2017). Although vegetal ornamentation intensified from the 14th century onwards, geometric motifs continued to be used in architectural structures in Ottoman architecture. In compositions, the number of sides in polygons increased, and circular geometric forms began to be used intensively (Mülayim, 1982).

Image 8: Geometric Figures in the Dome of Karatay Madrasah (Bulut, 2017)

Image 9: Geometric decorations on Ottoman-era tombstones (Çetin, 2015)

4. THE RELATIONSHIP BETWEEN BOW AND ARROW, SWORD AND DAGGER, AND LAMP MOTIFS AND SPACE IN TURKISH ART

For the Turks, the bow and arrow, besides being used as weapons of war and hunting, became a symbol of dominance for the "bow" and an invitation to allegiance in political and social life (Kuru, 2015). They depicted the bow not only as a symbol of dominance and sovereignty, but sometimes also as a symbol of the sky. They also called the rainbow "ebemkuşağı" (rainbow) and, drawing a parallel between the bow and the rainbow, believed it to be the golden bow of God (B. Ögel, 1997).

With the arrival of Islam, the bow and arrow figure, a symbol of dominance for the Oghuz Turks, continued to be used, appearing on the Seljuk flag and coins. Furthermore, it continued to be used in stylized forms in Seljuk architecture, on tombstones, and on various objects such as carpets and rugs. Examples of the bow and arrow motif are found in the last prayer areas and minarets of mosques in early Ottoman architecture, such as the Amasya Gök Medrese Mosque and the Kayseri Sahabiye Medrese (Kuru, 2015). Furthermore, the bow and arrow motif used on tombstones is thought to relate to the deceased's heroism, gender, profession, and title (Berkli, 2007b).

The sword has been considered one of the fundamental symbols of war and justice in Turkish culture, and has also been regarded as an element representing

the political and military authority of the ruler (Çaycı, 2008). This understanding is reflected in burial traditions; placing swords, daggers, and bows and arrows in graves has been a tradition practiced by Turkish communities since the Huns. It has also been suggested that this symbol depicted on tombstones was used to indicate the cause of death of the deceased, to highlight that the deceased was a member of a royal family, or to indicate that it was a martyr's grave (Berkli, 2007b). The sword figure found on the tombstones of those with Alevi beliefs is depicted as a symbol of devotion to Hz. Ali (Arslan, 2011).

The oil lamp motif, while an object used in Turkish art since ancient times, has also been depicted in various settings, sometimes imbued with iconological meanings (Kalfazade & Ertuğrul, 1989). Oil lamps, with their wide range of uses and association with faith, have generally been considered symbols of God and goodness, thus becoming a tool for spiritual struggle against darkness (Kalay, 2020). The lamp, as depicted in verse 35 of Surah An-Nur, is considered a symbol of divine light, leading to its use especially in prayer rugs and tombstones (Kalfazade and Ertuğrul, 1989). Examples of the lamp motif can be found in Erzurum (Berkli, 2007b), Ağrı (Çetin, 2015), and various cities in Anatolia (Kalfazade & Ertuğrul, 1989); particularly in Ahlat, rich and diverse applications of this motif are seen on tombstones from the Seljuk period (Karamağaralı, 1972).

Image 10: Ahlat Tombstones (Kalay, 2020)

5. CONCLUSION

Motifs in Turkish art are more than just aesthetic decorative elements; a deeper examination reveals them as a cultural coding system. These motifs carry powerful symbolic meanings reflecting the Turkish worldview, beliefs, and values. Bearing the traces of the equestrian steppe culture, these motifs, despite changes in geography and belief systems, maintain continuity in Turkish art, keeping cultural memory alive. In this context, the iconographic analysis of each motif is an important tool for better understanding the historical and cultural richness of Turkish art. Deciphering the symbolic meanings of motifs in Turkish art is not only a matter of historical and cultural curiosity but also a matter that remains relevant today. With cultures converging in the process of globalization, understanding the common and different symbolic codes of different cultures is of great importance for respecting cultural diversity and building bridges between different cultures.

In conclusion, motifs in Turkish art are an important legacy that bridges the past and the future as part of our cultural identity. Examining the iconographic meanings of these motifs makes visible the historical and cultural layers of Turkish art, contributing to academic research and holding significant value in terms of preserving and ensuring the sustainability of cultural heritage. Emphasizing that these motifs are not merely visual ornaments but also cultural codes carrying profound meanings will contribute to the development of cultural awareness as we pass this heritage on to future generations. In particular, examining the psychological and sociological dimensions of these motifs can provide us with a deeper understanding of the Turkish society's mental world. This will allow us to better understand how motifs in Turkish art are used as a universal language and their relationships with different cultures.

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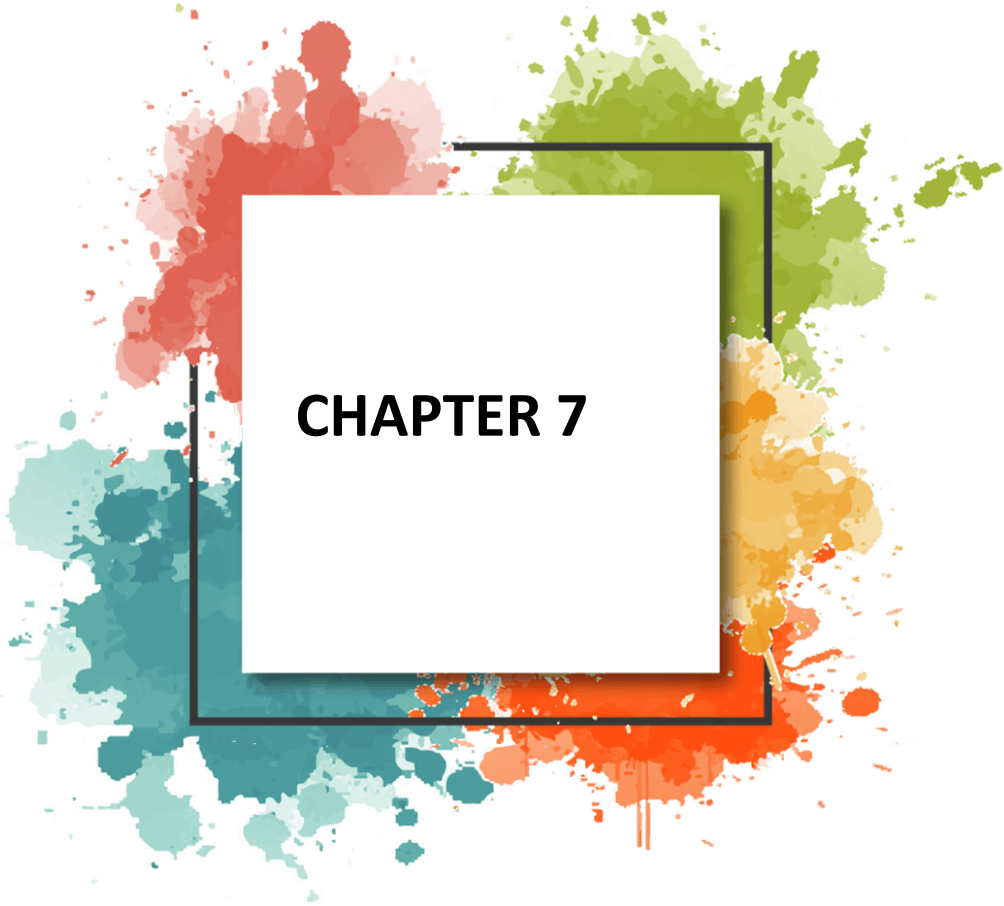
CHAPTER 7

Paternity Leave Policies in the OECD Context: Welfare Regime Dynamics, the Social Investment Perspective, and Neoliberal Rationalities

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INTRODUCTION

In the preceding 25 years, the broadening of paternity leave policies and parental leave provisions has been presented as an indication of a significant shift in the manner in which welfare states address the economic and demographic pressures of the post-industrial era. The diffusion of family policy has been observed to extend from the long-duration and high wage-replacement leave models of the Scandinavian countries to the late yet rapidly expanding arrangements of Southern Europe, from the market-oriented approaches of the Anglo-Saxon welfare states to the swiftly transforming family policy regimes of East Asia. This diffusion may be interpreted as indicative of a convergence of highly diverse institutional traditions towards a shared policy discourse. Convergence of this kind poses challenges to perspectives within the existing comparative welfare state literature, which emphasises the persistence of institutional diversity. Concurrently, it raises significant analytical questions regarding the mechanisms of policy transfer and the production of hegemonic discourse.

Nevertheless, this progress achieved in formal entitlements has proven insufficient to realise the anticipated structural transformation. Gender inequalities persist markedly in fundamental domains such as power relations, resource allocation, and the organisation of care work (Hochschild, 1989; Thévenon and Solaz, 2013; Addati et al., 2014). While the uptake rates of paternity leave have reached significant levels in countries endowed with strong "father quota" mechanisms, such as Sweden, Iceland, and Norway, in most contexts the profound gap between rights on paper and actual behavioural patterns remains unbridged. This predicament emanates from the inherent contradictions within these policies, wherein the tension between an egalitarian discourse and the institutional logic that perpetuates the prevailing gender order assumes a problematic dimension that transcends the technical intricacies of policy design.

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This study scrutinises the structural contradiction underlying the progressive discourse of paternity leave policies. The central thesis of this study is that these policies function as symbolic interventions that reproduce existing gender stratification, while legitimising this process by articulating the discourse of equality with structures of neoliberal economic governance. To summarise, the question of whether the reform possesses genuine transformative potential remains unanswered. Moreover, the issue is addressed only superficially.

The central argument posited here is that paternity leave reforms should be conceptualised not merely as a technical issue of family policy, but as an institutional manifestation of neoliberal feminism. This standpoint furnishes an indispensable framework for comprehending the actual transformative capacity of these policies and their structural limitations (Fraser, 2013; Rottenberg, 2018).

In order to disentangle this complex function, the study proceeds within an intersectional framework that integrates four complementary theoretical traditions. From the perspective of welfare regime theory, policies are situated within broader institutional configurations through a gender-centred critique, foregrounding the feminist revisions of Esping-Andersen's (1990) original typology advanced by theorists such as Orloff (1993) and Sainsbury (1996).

Within the framework of behavioural economics and practice theory, the cultural and occupational constraints that mediate the transformation of legal entitlements into actual behaviour are examined; the extent to which the "rational actor" presupposed by policy design encounters structural barriers in practical reality is critically interrogated.

In the context of social reproduction theory, the articulation of these policies with neoliberal governance structures is theorised in the context of capitalism's internal contradictions, and the systemic dimensions of the (re)invisibilisation of care work are elucidated (Bhattacharya, 2017). Finally, the study employs an intersectional analysis to address the systematic divergence in distributive outcomes across class, ethnicity and occupational categories, thereby posing the question of who benefits and who is excluded behind the façade of a universalist discourse (Crenshaw, 1991; Collins, 2002).

The present study conceptualises paternity leave reforms as an institutional reflection of neoliberal feminism, thus seeking to address a significant gap in the literature. A significant proportion of extant scholarship is focused on the technical dimensions of policy design or discourse analysis in isolation from structural political economy. The objective of this study is to transcend this dichotomy by addressing the question of why reforms yield only limited structural transformation. In order to do so, the study will move beyond technical policy design to interrogate the broader political economy and power relations

within which these policies are embedded. The article focuses on the theoretical framework and structural analysis.

1. THE EXPANSION OF PATERNITY LEAVE: DISCOURSE AND PROMISES

1.1. The Diffusion and Critical Analysis of Paid Paternity Leave Policies in OECD Countries

In the preceding 25 years, the dissemination of paid paternity leave policies across OECD countries has come to symbolise a significant transformation in social policy, legitimised through objectives such as deepening gender equality, reconciling work and family life, and redistributing care work (Lütolf, 2025; de la Porte et al., 2023a; de la Porte et al., 2023b; Kvande and Brandth, 2020). In order to comprehend the internal logic of this diffusion process, it is imperative to situate it within its institutional context. The diversity extends from Sweden's non-transferable "parental quota" model, reserved separately for mothers and fathers, to Japan's on-paper highly generous yet historically very low-uptake scheme[2] (Nakazato, 2019; Nakazato, 2017). This demonstrates how a seemingly universal policy wave assumes fundamentally different forms as it passes through distinct national institutional filters.

This contrast is not merely the product of technical policy design; rather, it reflects a composite outcome emerging from the intersection of cultural norms, labour market structures, welfare regime architectures, and patriarchal institutional logics.

This advancement at the level of formal entitlements contains deep structural asymmetries that contradict the promised egalitarian discourse. A close examination of core policy parameters reveals significant cross-national variations among OECD countries in terms of duration of leave, wage replacement rates, and eligibility criteria. This underscores the limitations of conceptualizing a "universal right" to paternity leave, which may be based on a misguided perception of homogeneity.

Furthermore, even within the same national policy framework, the distribution of these rights systematically diverges along class, occupational, and ethnic lines: those in precarious employment conditions, those constrained by low wage replacement rates, and those confronting the risk of organisational stigma are

[2] Japan is one of the countries within the OECD that grants fathers the longest periods of paid leave; however, the uptake rate remained at only 2–3% for a considerable period (Nakazato, 2019; Nakazato, 2017). According to data from 2018, while 82% of mothers utilised parental leave, the rate for fathers was only 6.16%. Furthermore, 80% of fathers took less than one month of leave, and 36% took less than five days (Rocha, 2021).

effectively deprived of the concrete capacity to benefit from rights that exist on paper (Castellanos-Serrano et al., 2024; Marinova and León, 2025; Petts et al., 2020; Geisler and Kreyenfeld, 2019; Pragg and Knoester, 2017). The political economy of this landscape serves to underscore the fact that policy is not merely structured by that which it formally permits, but also by the groups to whom it genuinely enables access.

The critical welfare state literature does not position these policies as transformative instruments. Rather, it positions them as mechanisms that reproduce the neoliberal understanding of welfare. The present body of scholarship reveals a structural paradox collectively signaled by paternity leave policies. This extends from Nancy Fraser's (1994) discussion of the "universal caregiver model" to Jane Lewis's (2001) analysis of the "decline of the male breadwinner model," and from Ann Shola Orloff's (2009) framework on gender and welfare regimes to the more recent contributions of Dungy and Krings (2024), as well as Bengtsson (2025). Rather than effecting a transformation of the gendered organisation of care labour, these policies serve to legitimate existing inequalities by effecting a shift in responsibility to individual choice and market-based solutions. This dynamic suggests that paternity leave reinforces a hegemonic discourse that internalises a superficial recognition of men's participation in care, while refraining from redistributing care labour or interrogating the broader structural conditions of social reproduction (Fraser, 2016; Bhattacharya, 2017).

Empirical studies that provide support for this critical framework clearly reveal the deep-seated tension between the utilisation of rights and the reproduction of the prevailing gender order. Research findings indicate that paternity leave policies only support men's participation in caregiving processes superficially, and are insufficient to transform the entrenched social perception that positions women as primary caregivers and men as "breadwinners" (Garcia, 2012; Haas & Hwang, 2019; Doucet & McKay, 2020; Mauerer, 2023).

Regardless of how robust legal guarantees may appear, organisational culture generates discouraging and dysfunctional mechanisms for fathers. Career anxieties, peer pressure, and the profound gap between managerial discourse and practice systematically constrain the uptake of leave (Gatrell & Cooper, 2008). The existence of rights in theory is thus contingent on a fragile foundation when it comes to translating into concrete behavioural change[3].

[3] Research indicates that paternity/parental leave arrangements in isolation do not result in significant uptake. In the absence of changes in economic incentives, workplace culture, and gender norms, behavioural change remains constrained. The primary vulnerabilities are as follows:

The findings demonstrate that the prevailing evaluative logic in policy analysis – one that prioritises technical design and measures success primarily through the scope of rights – exhibits a fundamental limitation. This logic obscures the institutional and ideological contexts within which policies are embedded, and it fails to provide an explanation for why ineffective reforms are repeatedly reproduced within the same framework. Consequently, a meaningful evaluation of paternity leave policies necessitates a shift beyond the mere existence of rights, necessitating an examination of how these rights are articulated with gender relations, class structures, and the rationalities of neoliberal governance.

The subsequent subsections methodically address this framework, focusing on welfare regime dynamics, the social investment perspective, and neoliberal rationalities.

1.2. Theoretical Framework and Analytical Approach

A comprehensive understanding of the effects of paternity leave policies on gender equality and care labour cannot be achieved through the analytical tools offered by a single theoretical tradition. In order to overcome this limitation, the present study proposes a multidimensional and intersectional analytical framework that integrates four foundational theoretical traditions which are structurally complementary. The primary objective of this framework is to interrogate systematically not only the formal content of policies, but also what they enable, what they render invisible, and which social relations they reproduce.

The initial axis of analysis is founded upon the principles of welfare regime theory. Gosta Esping-Andersen's (1990) typology of social democratic, conservative-corporatist, and liberal welfare states provides an indispensable point of departure for contextualising the institutional environment in which

- The financial incentives available to parents, such as low pay and the fear of income loss (insufficient wage replacement, especially when the father is the "primary breadwinner"), have been shown to have a discouraging effect on the taking of leave (Duffy et al., 2020; Kluve & Tamm, 2013; Kaufman, 2018).
- Gender norms, which perceive motherhood as the "natural caregiver" and fatherhood as the "breadwinner", result in leave being concentrated among mothers (Kluve & Tamm, 2013; Kaufman, 2018; Haas & Hwang, 2019).
- The prevailing workplace culture and the pervasive stigma surrounding flexibility (the assumption that the "ideal worker" is always at work and has no caregiving responsibilities) have a significant impact on the willingness of fathers to request extended leave (Duffy et al., 2020; Haas & Hwang, 2019; Birkett & Forbes, 2019).
- A paucity of information and intricate policy design (where policyholders are unaware of their rights or the regulations are overly complicated) has been demonstrated to reduce uptake, particularly among disadvantaged groups (Birkett & Forbes, 2019; Goodman et al., 2020).

policies operate. Nevertheless, this typology is characterised by substantial limitations, primarily due to its failure to incorporate gender as an analytical category. Ann Shola Orloff's (1993) feminist revision addresses this gap by introducing dimensions such as the "capacity to form and maintain an autonomous household" and "access to paid work," thereby rendering visible the structural effects of welfare regimes on gender relations and care labor. Within this theoretical framework, paternity leave policies are positioned not merely as instruments of work–family balance, but as institutional sites where gender stratification is either reproduced or transformed. In this respect, Diane Sainsbury's (1996) opposition between "breadwinner" and "caregiver" regimes functions as a complementary conceptual tool.

The second axis draws on behavioural economics and implementation theory, both of which call into question the assumption that legal rights automatically engender behavioural transformation. This dimension, which is frequently overlooked in conventional policy analysis, interrogates how the theoretically presumed "rational actor" is, in practice, shaped by structural constraints such as organisational culture, professional norms and the risk of workplace stigmatisation. Irrespective of the extent to which legal guarantees pertaining to paternity leave may be considered comprehensive, the behavioural change envisaged by policy design cannot be realised unless these informal institutional structures are concomitantly transformed. In this respect, the behavioural economics framework developed by Richard Thaler and Cass Sunstein (2008) and the implementation theory pioneered by Jeffrey Pressman and Aaron Wildavsky (1973) offer complementary analytical tools with which to bridge the gap between rights and practice.

The third axis is grounded in social reproduction theory, which problematises how progressive discourses are neutralised within neoliberal governance structures. In addition to the analysis presented by Nancy Fraser (2016), the volume edited by Tithi Bhattacharya (2017) explores the structural relationship between care labour and capitalist accumulation, as well as the ways in which this relationship is rendered invisible within policy discourse. From this standpoint, paternity leave policies are not merely technical regulations; they function as discursive instruments that construct a particular definition of reality concerning care labor while marginalizing alternative claims. The articulation of these instruments with neoliberal economic governance reveals that, ostensibly designed to promote transformation, they simultaneously operate to legitimise the existing order.

The fourth and final axis is intersectional analysis, which examines inequalities in policy outcomes across multiple axes of oppression. As posited by Kimberle Crenshaw (1991) in the context of the legal field, and further elaborated

by Patricia Hill Collins (2002) in her conceptualisation of the "matrix of domination", a range of tools are available for analysis. These tools facilitate comprehension of the systematic differentiation of access to and utilisation of paternity leave rights, with factors including class, ethnicity, and migration status. The question of which groups are included, excluded, and which groups face additional barriers can only be answered through an intersectional lens.

The four theoretical axes function not merely as separate analytical frameworks, but as an integrated approach that is mutually reinforcing and complementary. The present framework also determines the analytical stance of the study: policy is treated not simply as a text, but as a discursive process. In accordance with the methodology outlined by Carol Bacchi (2009) in her seminal work "What's the Problem Represented to Be?", the internal logic of policy texts is instrumental in determining the legitimacy of particular questions and their subsequent exclusion from the agenda. Rather than accepting declared egalitarian objectives unquestioningly, this analytical approach involves examining the underlying assumptions about gender, care labour and economic reality that underpin policy designs. It also involves analysing the contradictions these assumptions obscure and the power relations they perpetuate. Consequently, this approach unveils the internal tensions and unintended consequences that are frequently disregarded in conventional policy analysis. It thereby subject both the symbolic and structural operations of policy to critical scrutiny.

2. Welfare Regime Typologies and the Gendered Architecture of Welfare

2.1. The Gender-Blind Origins and Limitations of Welfare Regime Theory

The welfare regime typology systematically institutionalised by Gosta Esping-Andersen in The Three Worlds of Welfare Capitalism (1990) has long functioned as a defining analytical instrument in comparative welfare state research, structured around the distinction between liberal, conservative-corporatist, and social democratic regimes. By mapping state–market–family relations from a structural perspective and offering conceptual clarity that enables meaningful cross-national comparisons, this typology has made a significant contribution to theoretical debates in the field. However, this heightened conceptual clarity has been accompanied by a concomitant epistemological cost. The analytical framework of the typology constructs its central concepts – such as "decommodification" and "stratification" – on the basis of male wage labour experience, systematically rendering invisible women's social position, the gendered structure of care labour, and the intra-household division of labour (Lewis, 1997; Orloff, 2009; Seeleib-Kaiser & Sowula, 2020). Feminist scholars specialising in the field of welfare states have repeatedly emphasised that this restriction is not merely a methodological issue, but rather one that is

fundamentally epistemological in nature. The question that must be posed is: which experiences are constructed as "normative citizenship", and where are those excluded from this construction analytically situated?

An examination of these inquiries discloses that the Marshallian conceptualisation of "social citizenship" and the Esping-Andersenian concept of "decommodification", through which the former was operationalised, are predicated upon a subject that is inherently constrained. These concepts presuppose an autonomous individual actor capable of full-time participation in the labour market without the need to expend unpaid labour. In practical reality, this largely corresponds to the male wage worker. This construction, however, obscures the unpaid care labour and gendered division of labour that are pivotal to the commodification of male labour. While it focuses on state–market relations, it relegates the reproductive labour organised within the family to the status of a "natural" or "private" sphere, thus excluding it from the scope of analysis. The depiction of the "average production worker," situated at the core of Esping-Andersen's analysis, essentially reflects the archetypal male industrial worker. Through this representation, a specific gendered experience is presented as universal (Orloff, 1996). Consequently, a structural lacuna is present within the analytical framework of welfare regime theory that purports to grasp social inequalities holistically. This lacuna is created by the conditions that are, in fact, conducive to the reproduction of the aforementioned blind spot.

The theoretical pressure generated by feminist scholars' objections to this structural limitation, particularly from the 1990s onward, compelled a transformation of the field. Jane Lewis (1992) analytically demonstrated how welfare states reproduce the "male breadwinner/female caregiver" dualism through institutional policies, thereby systematically weakening women's economic autonomy. Ann Shola Orloff (1993; 2009) advanced the argument that the concept of decommodification is inadequate in accounting for women's discontinuous labour market participation, the gendered meanings of social rights, and women's capacity to establish and maintain an independent household. Consequently, she proposed that an expanded framework for analysing the welfare state should encompass additional dimensions, namely the "capacity for autonomy from the market" and the "ability to form a household independent of wage labour." This theoretical intervention is not merely critical of Gosta Esping-Andersen (1990); rather, it seeks to reconstruct his analytical tools from a feminist perspective. Diane Sainsbury (1996) further contributes to this transformative debate by theorising the opposition between "breadwinner" and "caregiver" regimes, suggesting that welfare regimes can be differentiated and classified not only according to state–market relations but also according to the institutional organisation of care labour.

The present study draws upon the seminal work of Mary Daly and Jane Lewis (2000) on the "social policy of care", which situates care labour at the core of its analytical framework. Within this theoretical framework, care is conceptualised not merely as an individual or familial responsibility, but as the product of a complex institutional arrangement in which the state, the market, and the voluntary sector are articulated with one another. In doing so, care labour is removed from the periphery of welfare state analysis and positioned as a central axis of social reproduction. From this standpoint, paternity leave policies must be assessed not only as an extension of individual rights, but also as institutional arrangements that bear implications for the gendered distribution of care labour.

As Joan Acker's (1990) conceptualisation of "gendered organisations" demonstrates, a complementary framework can be utilised to deepen this critical perspective on welfare state institutions at the organisational level. Acker's argument posits that, despite an organisation's outward neutrality, its internal hierarchies, norms, and division of labour systems are structured in ways that systematically favour one gender over another. This framework enables the interrogation of the welfare state itself as an institution: namely, which assumptions are treated as natural within the institutional logic inherent in processes of policy design, implementation, and evaluation, and which claims are deemed illegitimate? This question is of particular theoretical significance for the analysis of paternity leave policies. Despite the fact that such policies are presented as being institutionally "neutral", they continue to reproduce gendered practices through organisational culture and professional norms.

When considered as a whole, these theoretical debates clearly demonstrate that the concept of welfare regime theory is inadequate in explaining the real functioning and limitations of paternity leave policies unless it is expanded to include gender as an analytical category. The conceptual tools developed within feminist welfare state scholarship are indispensable for rendering visible the structural contradictions underlying policies that are presented through a discourse of formal equality. The following subsection will examine how differences among welfare regimes across OECD countries shape both the content and the utilisation of paternity leave policies.

2.2. De-familialization and the Contested Expansion of Gender-Centered Analysis

Gosta Esping-Andersen's (1999) theoretical response to feminist critiques represents a significant yet contested step towards incorporating gender into welfare regime analysis. In Esping-Andersen's Social Foundations of Postindustrial Economies, the concept of "de-familialization," proposed by Ann Shola Orloff (1993), is adopted, thereby adding a new dimension to the typology. This concept refers to individuals' capacity to sustain their welfare and livelihood

without being trapped in dependence on family relations; it is operationalized through indicators such as the extent of public services, cash benefits, and extra-household care infrastructures (Orloff, 2009). Esping-Andersen's theoretical move is of particular interest in the context of feminist critique, as it successfully incorporates this critique into the mainstream of welfare state theory. Nevertheless, debates concerning the substance and measurement of the concept reveal that this expansion represents a limited and problematic compromise.

The operational inconsistencies of the de-familialization concept constitute the primary point of contention in this debate. As demonstrated in the comprehensive comparative analysis conducted by Clare Bambra (2007), the application of disparate measurement approaches gives rise to substantial inconsistencies in the classification of regimes. Consequently, the same country may be placed in different regime categories depending on the indicators employed. This methodological ambiguity weakens the analytical reliability of the concept and raises the question of what de-familialization measures the concept fails to capture. A more fundamental critique points to a structural paradox that erodes the feminist content of the concept. The de-familialization approach frames liberation from family dependence as a progressive achievement, yet it leaves care labour analytically invisible and reduces it to a service to be purchased on the market rather than recognizing it as a public responsibility. In this sense, the concept harbours an implicit neoliberal logic that legitimises, rather than questions, the commodification of care.

The feminist critique of defamilialization interrogates the extent to which the concept of equality is genuinely transformative. In her 2009 publication, Jane Jenson contends that an approach which treats women's economic independence as the sole indicator of progress reinforces a neoliberal rationality that renders invisible both the social value of care work and demands for its collective recognition. Within this theoretical framework, the concept of the "independent individual" is predicated on the assumption that access to the market is the ultimate measure of equality. However, this analysis fails to consider the mutual interdependence and solidarity that are inherent in care relations. In contrast, Chiara Saraceno (2004) emphasises that true gender equality cannot be achieved solely through income independence, but rather necessitates the concurrent realisation of both women's economic emancipation and their liberation from care responsibilities. The separation of these two conditions gives rise to a structural incompleteness in policy design. This discourse can thus be interpreted as the articulation of a more extensive discord: between a limited conception of equality as defined by market access, and a more profound conception of justice that acknowledges care work as a legitimate, valuable, and collectively endorsed social activity.

Another factor that exacerbates this tension is the inadequacy of the Social Investment Perspective's response to this so-called "feminist dilemma." While the Social Investment Perspective actively promotes women's employment, it relegates to a secondary position the provision of high-quality and accessible care infrastructure that constitutes the precondition for such employment; in doing so, it deprives its discourse of equality of substantive structural intervention. As Ann Shola Orloff (2009) astutely observes, this policy orientation, far from liberating women from traditional gender roles, effectively confines them simultaneously to both the paid labour market and the burden of unpaid care, delegating the resolution of the resulting tension to market mechanisms. The concept of the "second shift", as defined by Arlie Russell Hochschild (1989), retains its relevance despite the aforementioned transformations. This persistence constitutes the most concrete indication that formal rights alone are insufficient in the absence of structural intervention, and it also explains how the "gender-blind" origins of welfare regime analysis continue to permeate contemporary policy practices.

A more profound transformation, which cuts across all these debates, renders it necessary to reassess the explanatory power of welfare regime typologies. The analysis by Daniele Ferragina and Martin Seeleib-Kaiser (2014) demonstrates that the institutional differences between regimes obscure a shared process of convergence in which all regimes increasingly rely on the commodification of both women's and men's labour. This convergence weakens the analytical leverage of established concepts such as decommodification and defamilialization, confronting welfare regime theory with the need for a new theoretical quest from both methodological and normative perspectives. Although the Social Investment Perspective (SIP) has emerged as a framework seeking to fill this gap, the theoretical tensions it generates constitute the focal point of the discussions addressed in the following subsection.

3. THE SOCIAL INVESTMENT PERSPECTIVE (SIP) AND THE INSTRUMENTALIZATION OF CARE

3.1. Social Investment as a Post-Neoliberal Paradigm

Since the 2000s, the Social Investment Perspective (SIP), a term coined by the Organisation for Economic Co-operation and Development (OECD), the European Commission, and numerous welfare state scholars, has emerged as the expression of a significant paradigmatic shift in theoretical debates on the welfare state. SIP is positioned as a "third way" between the traditional welfare state's logic of repairing damage ex post and neoliberalism's market-centred discourse of individual responsibility (Morel et al., 2012; Hemerijck, 2018). SIP reconceptualises welfare expenditures not as passive income transfers or mechanisms of social compensation, but as forward-looking social investments.

Within this theoretical framework, the role of the state is subject to a fundamental transformation. Rather than acting in a reactive capacity, responding to problems after they have arisen, the state is recast as a proactive agent that anticipates risks, prepares individuals for a world of opportunities, and develops human capital as a long-term source of productivity. This reframing process serves to legitimize public expenditures, redefining them not as consumption, redistribution, or cost, but as productive investments with the aim of generating economic and social returns.

In order to comprehend the political appeal of the Social Investment Perspective (SIP), it is necessary to examine not only its substantive content but also its rhetorical structure. The present study seeks to demonstrate that SIP offers a flexible discursive framework capable of responding simultaneously to neoliberal pressures for cost containment and to social democratic political traditions seeking to sustain demands for social solidarity. This is in close genealogical relation to Anthony Giddens's (2000) conceptualization of the "Third Way." This flexibility helps to explain how SIP has been embraced across highly diverse political contexts, ranging from Scandinavian social democracies to Anglo-Saxon centre-left governments. From the standpoint of policy transfer and the norm-diffusing role of international organisations, the global dissemination of the SIP discourse by the Organisation for Economic Co-operation and Development (OECD) and the European Union has transformed this perspective from a technical policy preference into a hegemonic framework (Jenson, 2010; Mahon, 2013).

Within this new welfare rationale, family policies – particularly paternity and parental leave schemes – are reframed as strategic social investment instruments (Morel et al., 2012; Hemerijck, 2018). From the standpoint of the Social Insurance Program (SIP), it is hypothesised that these policies serve three complementary functions: facilitating women's sustainable participation in the labour force by enabling work–family balance; securing long-term human capital accumulation by supporting early childhood development; and responding to macroeconomic concerns such as fertility balance and fiscal sustainability (Morel et al., 2012). This tripartite function presents such policies as "win-win" mechanisms that simultaneously advance gender equality, economic efficiency, and demographic sustainability, thereby reinforcing their political legitimacy. Indeed, as Giuliano Bonoli (2013) emphasises, the discursive expansion of SIP in the field of family policy clearly demonstrates the strategic role these policies play in coalition-building processes.

However, this discourse, which posits a notion of "multiple wins," necessitates a critical reading. The claim of multifunctionality necessitates the question of which objectives are truly determinative and which remain merely discursive

representations (Nolan, 2013). The question of prioritisation among gender equality, economic efficiency, and demographic balance is not merely an analytical question, but one that is fundamentally political in nature. In circumstances where these objectives are in conflict, a tacit choice regarding which goal takes precedence is inherent in policy design itself. Peter Taylor-Gooby's (2004) analysis of "new risks" in welfare states provides an additional analytical tool for explaining how tensions among these priorities are systematically obscured.

A more fundamental critique pertains to the systematic instrumentalisation of social justice claims within SIP. Gender equality is positioned not as a normative imperative in its own right, but rather as a functional requirement of economic efficiency. The tension engendered by this transformation gives rise to the question of how care work is valued and for whom it is considered valuable, thereby establishing the theoretical foundation for the subsequent examination of the issue of instrumentalisation in the following subsections.

3.2. The Limitations of the Social Investment Approach and Gender-Critical Perspectives

The Social Investment Perspective (SIP) has gained a strong basis of legitimacy in both academic and policy circles in the process of restructuring the post-industrial welfare state. The study's theoretical framework is anchored in the long-term economic and social returns of investments in child welfare, early childhood education, and human capital. This perspective presents a compelling discourse that redefines social spending as a productive investment rather than a mere burden (Morel et al., 2012; Hemerijck, 2017). Nevertheless, feminist welfare state scholars have repeatedly emphasised the existence of a profound and systemic discord between SIP's discursive commitments to gender equality and its practical policy choices. This tension does not stem from accidental or technical inconsistency; rather, it arises from the gendered nature of the foundational assumptions upon which SIP is built.

The most fundamental limitation of the Social Investment Perspective (SIP) lies in its tendency to shift the focus of analysis and policy priorities toward children and the future, thereby relegating adult women's equality claims to the background. Within this approach, women are positioned not as autonomous subjects of equality in their own right, but rather as "mothers raising the future workforce" or as instrumental agents securing child welfare. This framing of gender equality, therefore, does not seek to establish its legitimacy through its inherent value, but rather through its contribution to child development and economic productivity. While SIP does promote women's participation in the labour force, it is predicated on the "ideal worker" assumption, which fails to interrogate the unequal distribution of care work within the household or gender-

based discrimination in working life. The comprehensive comparative study by Marie Hyland and colleagues (2021) provides empirical evidence that supports this finding. The increase in women's labour force participation rates across OECD countries is rarely accompanied by a redistribution of unpaid care work within the household. The model of the "working mother" remains that of a "mother who works".

The fundamental inconsistency in the structural design of SIP can be traced back to its foundational "adult worker" model. Historically grounded in the norm of men's largely uninterrupted employment trajectories, free from substantial care responsibilities, this model renders domestic care work invisible and positions it as a secondary sphere outside working life (Saraceno, 2015; Cooke, 2016). Despite the emphasis in discourse on the notion of "sharing care", in practice, care work is either transferred to market relations or effectively remains the responsibility of women (Saraceno, 2015; Hemerijck et al., 2023). Consequently, rather than being redefined as a public and egalitarian domain of responsibility, care becomes a structural burden that returns to women through different mechanisms. In this context, even policy instruments with transformative potential – such as paternity leave – often function less as measures aimed at fundamentally reshaping gender relations and more as instrumental policies designed to increase women's employment and the overall labour supply (Marinova and León, 2025; Duffy et al., 2020; Farré, 2016).

The instrumental logic of the Social Investment Perspective (SIP) has the capacity to transform not only policy priorities but also the very construction of equality itself. Within this approach, gender equality is legitimised not on the basis of its intrinsic social and political value, but as a component of "investment returns," justified through its contribution to economic efficiency, competitiveness, and growth (Lawless et al., 2021; Lawless et al., 2022). As emphasised by Andrea Cornwall and Althea-Maria Rivas (2015), as well as Karin Lanz and colleagues (2020), this shift erodes the intrinsic value of equality and displaces unequal power relations between women and men from the centre of debate. Conceptualised in the literature as "progressive neoliberalism," this orientation relies on policy interventions that leave the market order largely unquestioned and often remain superficial, rather than genuinely confronting deep and structural issues such as care regimes (Nancy Fraser, 2016; 2017). In this process, equality is reduced from a political principle aimed at transforming social relations to a technical instrument serving the enhancement of economic performance. The most salient manifestation of this transformation is evident in the relocation of narratives on gender inequality from a language of political demand to the "best practice" category of governance discourse.

The practical consequences of this narrowing framework are clearly observable in policy implementation. Policies are frequently reduced to numerical targets and performance indicators; this limited framing systematically overlooks intersecting axes of inequality such as class, race, and migrant status, as well as institutional power relations (Lawless et al., 2021; Lawless et al., 2022; Lanz et al., 2020). The evidence presented in this study further reinforces this perspective, highlighting that care responsibilities do not simply disappear; rather, they are transferred to precarious forms of labour performed by impoverished and migrant women, thereby perpetuating inequalities at new and broader levels (Mora, 2025; Fu et al., 2018; Rodríguez-Modroño et al., 2022). As Tronto (2013) asserts, the prevailing reality necessitates a reconfiguration of care, moving beyond a narrow conception of individual responsibility or a market-driven service, to a paradigm that acknowledges its significance as a democratic issue. This transformation demands collective political action to ensure its realisation. This perspective renders the instrumental limits of SIP clearly visible and analytically demonstrates the kind of conception of equality that the social investment discourse leaves outside its scope.

4. NEOLIBERAL RATIONALITIES AND THE INSTRUMENTALIZATION OF CARE LABOR

4.1. Paternity Leave Policies in the OECD Context: The Contradiction Between Economic Rationality and Social Reproduction

In the context of international policy, the role of the Organisation for Economic Co-operation and Development (OECD) in shaping the discourse on paternity leave is distinct from that of other international actors. In comparison to the human rights– and justice-based framings advanced by organisations such as the United Nations (UN) and the International Labour Organization (ILO), the OECD grounds these policies primarily in terms of economic rationality and fiscal sustainability. The OECD reports and policy briefs under discussion provide a robust justification for the expansion of paternity leave provisions through economic objectives, including the increase in women's labour force participation (OECD, 2025a; Fluchtmann et al., 2024), the maintenance of demographic balance and fertility rates (Ruhm, 2000; Tanaka, 2005), the assurance of the intergenerational continuity of human capital (Huerta et al., 2013), and the enhancement of labour market productivity (Anxo et al., 2007; Rossin-Slater et al., 2013). Despite the ostensibly egalitarian and progressive language employed in this discursive framing, there is an implicit instrumentalisation of reform, with gender equality being subordinated to the objectives of economic growth and competitiveness (Hook and Li, 2025; Rønsen and Kitterød, 2015). Consequently, the concept of equality evolves from its traditional role as a normative end in itself to a functional variable that supports

macroeconomic performance. This analytical transformation necessitates critical scrutiny to ensure its validity and relevance in the context of economic policy.

In order to comprehend the theoretical underpinnings of this discursive shift, it is imperative to turn to Nancy Fraser's analysis of the structural contradiction between financialised capitalism and care labour, which offers a robust and fruitful framework. Fraser (2016) contends that a fundamental tension exists at the core of contemporary capitalism. While capital accumulation is heavily reliant on vital processes such as care, education, and the daily reproduction of households (Bhattacharya, 2017), the logic of limitless expansion and profit maximisation systematically erodes and destabilises these very processes. This contradiction suggests that capitalism's self-reinforcing mechanism simultaneously undermines the conditions of its own existence. The position of care labour within this structural paradox must therefore be understood not merely as an economic issue, but as a political question that shapes the relationships among power, gender, and social reproduction. As demonstrated in Silvia Federici's (2012) historical analysis, this contradiction has historically been managed through implicit subsidies provided by women's largely invisible and unpaid labour, through public care services, and through family supports secured by strong labour movements.

In the neoliberal era, the response to this structural tension is indicative of a policy logic that is grounded not in resolving the contradiction, but rather in reorganising it. The gradual retrenchment of public care and welfare services (Bakker, 2007), the promotion of women's intensified participation in the labour market without providing the necessary institutional and infrastructural supports, and the increasing relocation of care labour onto racialised relations of exploitation mediated through migrant workers (Glenn, 1992; Nancy Fraser, 2016) constitute three central manifestations of this policy logic. These processes are not independent of one another; rather, they form interconnected and mutually reinforcing components of a broader structural whole. The expansion of global care chains is a salient manifestation of this configuration, whereby care responsibilities are not eliminated, but rendered invisible and transferred to less privileged groups.

Within this structural context, paternity leave policies are designed not as interventions that fundamentally transform work and care regimes, but as complementary and balancing instruments aimed primarily at increasing women's employment. The solutions proposed by these policies are largely behavioural in nature: fathers are encouraged to assume greater responsibility for household care. However, such encouragement is offered without the structural conditions necessary to transform the social organisation of care. More radical transformations, such as reducing standard working hours, redefining the material

and symbolic value of care labour, or comprehensively reconstructing care infrastructure, are frequently omitted from the policy agenda (Rai et al., 2014; Fraser, 2016). The concept of "depleting care", developed by Shirin M. Rai and colleagues (2014), provides an illuminating analytical tool in this regard: care labour consumes the bodily, emotional and economic resources of those who perform it, while the institutional support mechanisms that might replenish this depletion are simultaneously weakened. This approach can be interpreted as a policy logic that elects to avoid direct confrontation with and comprehensive transformation of the structural dimensions of the problem. Instead, it aims to enhance manageability and personalise its impact.

In conclusion, the economic rationality underpinning the OECD's discourse on paternity leave is not an incidental preference, but a consistent reflection of the neoliberal mode of governance in its reframing of welfare policies. This framing instrumentalises equality, postpones the structural transformation of care labour, and shifts the costs of the crisis of social reproduction from the public sphere to individuals, from the state to the market, and from the privileged to the vulnerable. The following subsection examines in detail the concrete institutional manifestations of this policy logic and the structural constraints embedded in paternity leave arrangements.

4.2. Progressive Neoliberalism and Paternity Leave: The Market-Conforming Transformation of Gender Equality

The discursive structure and political function of contemporary paternity leave policies are rendered highly analytical clear when considered as an institutional manifestation of what Nancy Fraser (2017) has termed "progressive neoliberalism." In Fraser's theoretical framework, the political project under discussion does not entirely exclude demands for emancipation and equality; rather, it discursively incorporates them, thereby neutralising their radical political potential. This process of appropriation occurs in conjunction with the articulation of such demands in accordance with market rationality. Consequently, the potential for structural transformation is significantly constrained, while the language of equality begins to function as a reservoir of legitimacy for the prevailing order. Catherine Rottenberg's (2014) conceptualisation of "neoliberal feminism" is similarly problematic. In this theoretical framework, the concept of equality is detached from the concept of collective rights and institutional restructuring, and is reduced to narratives of individual success, entrepreneurship and self-realisation. These two conceptual frameworks are complementary and provide a powerful and productive analytical foundation for understanding the political tension embedded in paternity leave policies. Indeed, such policies are among the most visible manifestations of a

discursive economy that promises equality while avoiding the structural transformation that this promise entails.

Within this theoretical framework, the concept of gender equality is increasingly equated with the integration of women into the labour market. Consequently, matters pertaining to the reorganization of working time, the reversal of the structural devaluation of care labour, or the fundamental transformation of production–reproduction relations are marginalised. This redefinition of equality must be considered as indicative of a shift in policy priorities, but also as a discursive operation of power that determines which questions can be asked and which are excluded from the agenda. In this context, the concept of paternity leave is frequently articulated through the rhetoric of "fair sharing" and "equal responsibility". However, the structural conditions necessary to substantiate these claims, such as the reduction of standard working hours, the universalisation of care infrastructure, and the material recognition of care labour, remain largely absent from policy agendas. The concept of the "caring father" is a prominent one in policy communication and social media, assuming a symbolic function in this process. These representations serve to substitute for substantive equality policies, thereby generating a politics of "good intentions" that softens structural demands and legitimises the system. The present study posits that the function of the discursive economy in this particular context is to serve as a political surrogate for material transformation. This is achieved by creating the impression of change, while simultaneously postponing structural reform.

The most salient feature of this neoliberal feminist perspective is its tendency to treat care not as a structural domain requiring public investment, shared responsibility, and societal reorganization of time, but rather as a personal issue to be resolved through individual behavioural adaptation and market-based instruments. As Hanna Ylöstalo (2022) has observed, such policy frameworks effectively transform care labour from a public obligation to an investment in "human capital" that supports economic efficiency, thereby legitimising the marketisation of care services. Marketization is a multifaceted concept encompassing the commodification of services, as well as the reshaping of values, responsibilities, and rights associated with care according to market logic. In this process, structural alternatives – such as universal public childcare services, the reduction of working hours, or the strengthening of public care infrastructure – are relegated to a secondary position, particularly in OECD-centred debates, and are systematically postponed under the justification of fiscal sustainability. The comparative study on welfare state reforms conducted by Mats Wärneryd and Anders Norberg (2024) clearly demonstrates that this pattern is consistently reproduced across diverse institutional contexts; the postponement

of structural interventions constitutes a policy choice, and that choice itself carries political content.

As Rossella Ciccia and Mieke Verloo (2012) have pertinently observed, even ostensibly egalitarian arrangements such as paternity leave carry the potential to transform household labour into a malleable and functional component of neoliberal growth strategies, rather than effecting a fundamental alteration to the patriarchal division of labour. This risk does not stem from technical shortcomings in policy design, but from the structural logic of the political economy within which these policies are embedded. Consequently, policy discourse centred around the Organisation for Economic Co-operation and Development has been found to prioritise solutions that are compatible with the prevailing growth regime and cost-efficient, rather than producing a structural response to the care crisis. The attempt to manage the care crisis through market instruments is inherently contradictory, as it seeks to satisfy both profit motives and existential necessities simultaneously. It is evident that reforms which fail to address this contradiction are unlikely to engender structural transformation; rather, they serve to perpetuate the prevailing order, offering only transient relief. Consequently, evaluating the authentic transformative potential of policies necessitates a comprehensive examination that extends beyond mere declarations of objectives to the underlying political choices, the unvoiced alternatives, and the power dynamics they perpetuate.

CONCLUSION

This article has examined the expansion of paternity leave policies across OECD countries over the past quarter century from a critical perspective. Rather than considering this to be a mere achievement of gender equality, it has been argued that it is better understood as symbolic interventions embedded within neoliberal governance structures and market-centred frameworks of social reproduction. Utilising a systematic approach derived from the principles of comparative welfare state theory, feminist political economy, and social reproduction analysis, it has been demonstrated that, despite the progressive rhetoric employed, these policies serve to perpetuate pre-existing gender hierarchies, the gendered distribution of care labour, and labour market segmentation. In this respect, the study calls into question the prevailing evaluative logic that measures policy success through the expansion of formal rights and argues for the need for a broader analytical framework.

The theoretical analysis developed throughout the article reveals three interrelated core findings. Firstly, Esping-Andersen's welfare regime typology is inadequate from a feminist perspective due to its failure to internalise gender as an analytical category. Subsequent revisions that emphasise the concept of defamilialisation, while representing a partial advancement, have not led to the

genuine centring of care labour. Instead, they have resulted in its reconfiguration in ways that integrate it into market logics. This revision signifies a certain degree of progress; however, it also reinforces an understanding that presumes individuals will resolve care needs through market mechanisms rather than reconstructing care as a public responsibility. Secondly, the Social Investment Perspective integrates equality claims into a discourse of economic efficiency, thereby blunting their transformative potential. It transforms care from a public obligation into an instrumental "investment" component and, in doing so, reduces gender inequality from a political issue to a managerial and technical problem. Thirdly, within the discourse of OECD policy, progressive neoliberalism redefines gender equality within a paradigm that is compatible with the market. In doing so, it systematically excludes structural imperatives, such as the reduction of standard working hours and the establishment of a universal care infrastructure, from the agenda. This results in the sidelining of demands for the fundamental reorganization of care regimes.

The constellation that emerges at the intersection of these three findings demonstrates that the profound structural gap between the discourse of paternity leave policies and their gender equality outcomes does not stem from an accidental failure of implementation; rather, it points to a systematic tension that is an inevitable product of neoliberal governance logic. This tension gives rise to a "discursive bind" which traps policy design debates in a vicious cycle: no matter how sincerely equality goals are articulated, market compatibility and growth imperatives ultimately determine what is prioritised (Bumiller, 2008; Lorey, 2015). In this context, the application of the analytical framework formulated by Bacchi (2009) through the question "What's the problem?" is particularly illuminating: paternity leave policies define the social organisation of care not as a structural issue, but as a technical matter that can be resolved through the adjustment of individual behaviours. This framing predefines which solutions are deemed legitimate and renders structural alternatives invisible from the outset.

In order to achieve a genuinely transformative impact, it is essential that these policies are assessed beyond the confines of technical parameters such as leave duration and wage replacement rates. Instead, they must be examined in conjunction with behavioural constraints, intersectional inequalities of access, and structural mechanisms of social reproduction. The findings reveal that the impact of factors such as class, ethnicity, and migration status on policy outcomes has the effect of highlighting the groups who are included in, and those who are excluded from, rights that are presented as "universal." This analytical expansion constitutes the focal point of the second article in the research series, which will address the empirical level of structural inequalities in the use of rights and the ways in which organisational culture shapes policy implementation. The two

articles, when considered as a whole, seek to provide an integrated analytical framework that encompasses both the discursive and practical dimensions of paternity leave policies.

The present findings can be considered to contribute to the existing literature in three distinct ways. In principle, this approach integrates welfare regime theory, the social investment perspective, and the critique of progressive neoliberalism within a single analytical framework. This integration enables the approach to overcome the limitations of the singular theoretical perspectives that dominate paternity leave research. At the analytical level, the intersectional approach – which interrogates policies simultaneously in terms of both their discursive and structural functions – renders visible the power relations and mechanisms of legitimation that are often overlooked in policy evaluations. At the normative level, the study establishes the foundation for an alternative policy vision that advocates the re-institutionalisation of care as a human rights issue and a collective obligation.

In conclusion, the structural gap between the discourse of paternity leave policies and their gender equality outcomes can be narrowed not merely through technical adjustments, but through the explicit transcendence of existing neoliberal governance structures and the construction of alternative welfare frameworks that place care labour at the centre of social and economic organisation. As conceptualised by Tronto (2013) in her notion of "caring democracy," such a transformation necessitates the reclamation of care not solely as a policy domain, but also as a pivotal nexus of democratic deliberation, collective responsibility, and political imagination. The quest for gender equality must evolve beyond a focus on market-centred solutions and compromise, evolving into a demand for radical social restructuring that reconstitutes equality not as a form of investment return, but as a condition of collective existence. This transformation necessitates a theoretical and political effort capable of reshaping both the academic research agenda and policy practice; the present study aims to offer a modest yet resolute contribution to this endeavor.

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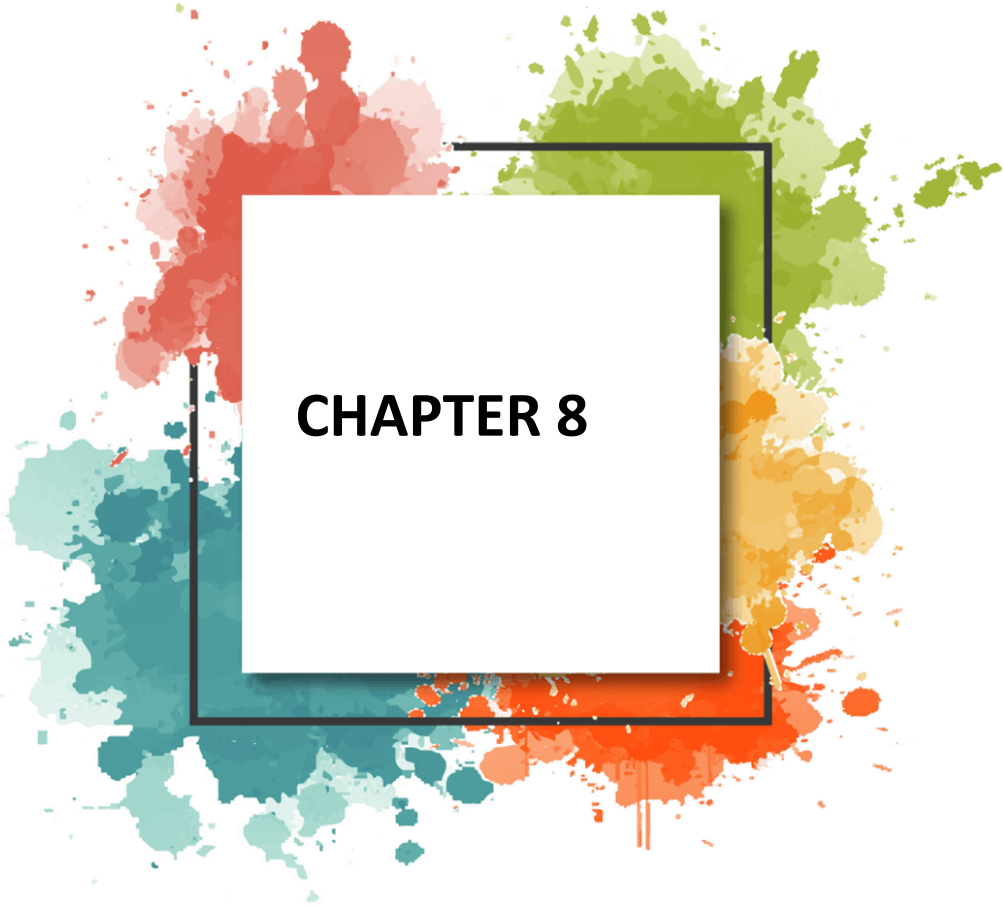
CHAPTER 8

Artificial Intelligence and Algorithmic Marketing: A Conceptual Framework for Consumer Experience and Behavioral Outcomes

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Introduction

In today's marketing environment, with the acceleration of digitalization, data-driven artificial intelligence technologies have become a crucial element in strategy development, triggering a radical transformation in interaction with consumers. This transformation has created a new paradigm in marketing, making businesses' decision-making processes more analytical (Gür, 2022). Particularly in recent years, with the widespread adoption of big data analytics, machine learning algorithms have become common in marketing, enabling businesses to analyze consumer preferences in real time and offer more personalized recommendations (Altın, 2024).

The rapid advancements in digital technologies have brought about a comprehensive transformation in the field of marketing. This transformation is not limited to the addition of digital channels to marketing communication. The real impact lies in the increased production, processing, and analysis of data, with marketing decisions increasingly shaped by algorithms and artificial intelligence systems. Today, businesses no longer analyze consumer behavior solely through past sales data or traditional market research. Instead, they utilize numerous digital data sources, including online browsing behavior, social media interactions, mobile app usage, location information, click behavior, and digital footprints left across various platforms, enabling much more comprehensive analyses (Grewal et al., 2020; Wedel & Kannan, 2016). These developments have led marketing to move away from its previously largely intuitive and campaign-driven structure, towards a data-driven, predictive system where automation plays a significant role.

Applications such as machine learning, natural language processing, recommendation systems, chatbots, sentiment analysis, and image recognition have become increasingly crucial in both the strategic and operational processes of marketing activities. AI-based systems are used in many different areas such

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as customer segmentation, price optimization, ad targeting, and customer service (Davenport et al., 2020). According to Huang and Rust (2021), AI in marketing is not merely a technological tool that automates specific tasks. It also serves as a strategic infrastructure that reshapes customer relationships, enhances personalization capabilities, and enables businesses to make more predictive decisions. Therefore, today's marketing approach has evolved towards a hybrid structure where human decision-makers and algorithmic systems work together.

The inclusion of such complementary technologies in marketing processes allows firms to analyze consumer reactions and preferences in real time. When used in conjunction with content analytics, the impact of marketing messages can be measured more precisely, and the data obtained can be used to optimize these messages (Gür, 2022). Another important component of this development is AI-powered chatbots and virtual assistants. These systems provide a more fluid and holistic digital customer service experience by offering instant and personalized answers to consumer questions (Yazıcı, 2024). The widespread adoption of facial recognition technologies or contactless payment technologies in shopping systems has led to a gradual blurring of the lines between physical and digital environments (Gülen et al., 2023).

A comparable trend is observed in green marketing strategies. AI-powered green marketing initiatives provide personalized product recommendations that consider consumers' environmental awareness, thereby creating value and reinforcing brands' commitment to ethical responsibility (Şen, 2025).

To explain these new structures and their effects, different concepts have been developed in the literature. While the concept of "algorithmic marketing" describes marketing decisions being guided by data flows and computational systems, "data-driven marketing" draws attention to the data-based information infrastructure that forms the basis of these decisions (Wedel & Kannan, 2016).

From another perspective, the 'platform economy' approach demonstrates that marketing processes cannot be explained solely through linear relationships between businesses and consumers. According to this viewpoint, digital platforms have become central to the marketing ecosystem due to their ability to organize interactions with consumers, determine visibility, and manage data flow (Subramaniam, 2020; Kopalle et al., 2020). Therefore, the impact of artificial intelligence and algorithms on marketing has not been limited to the use of new technologies, but has also enabled the reshaping of marketing logic, competitive dynamics, and customer experience.

Algorithmic systems integrated with technologies such as metadata and augmented reality (AR) have further expanded the scope of digital marketing.

These developments enable the provision of a more interactive and multi-dimensional brand experience to consumers (Aytaç, 2024).

In conclusion, the combined use of advanced data analysis techniques and sensory marketing practices transforms the relationship between brands and consumers into a deeper and more multifaceted structure. This creates a more lasting interaction environment that strengthens consumer loyalty (Aslaner, 2022, Sayın, 2024), while the increased efficiency achieved through the automation of marketing processes enables businesses to manage their marketing budgets in a more strategic and goal-oriented manner (Gökerik & Aktaş, 2024).

2. Theoretical Framework of Artificial Intelligence and Algorithmic Transformation in Marketing

Artificial intelligence technologies enhance the operational efficiency of businesses by mimicking human-like cognitive processes in marketing strategies, and enable algorithmic models to play a more decisive role in predicting consumer behavior (Zeydan, 2023). These developments allow brands to move beyond simply reacting to consumer demands and develop more predictive and strategic approaches. Thus, providing hyper-personalized experiences in the interaction between customer and brand has become more feasible and accessible (Aytaç, 2024, Binbir, 2021).

In this context, the Marketing 5.0 approach combines human-centered thinking with AI-powered automation systems, increasing businesses' capacity to generate sustainable value that responds to both individual consumer needs and societal expectations (Koçak, 2024). This new interactive environment allows businesses to move beyond traditional advertising; it contributes to the formation of a more dynamic marketing ecosystem that influences customer loyalty, brand preference, and repeat purchase behavior (Şenyapar, 2024). The ability of machine learning algorithms to analyze large datasets enables businesses to predict consumer preferences more accurately. This allows companies to manage their multi-channel marketing strategies more effectively by offering seamless and personalized value propositions at different touchpoints (Koçak, 2024, Özkaynar, 2024).

In recent years, the technological infrastructure used in marketing efforts has evolved from being merely a technical tool carrying communication channels to a comprehensive structure encompassing decision-making, value creation, and shaping customer experience. With this transformation, marketing activities are no longer limited to intuitive and campaign-focused approaches; they have evolved into a more systematic structure based on automation and data-driven predictions. Indeed, the development of artificial intelligence-based systems is creating transformative effects on marketing strategies, sales processes, and

customer behavior. This is leading businesses to concentrate their technology investments towards increasing the efficiency of marketing activities, improving predictive capabilities, and personalization (Davenport et al., 2020, Grewal et al., 2020).

In this context, algorithmic marketing refers to an approach where marketing decisions are guided not only by humans but also by systems that process and analyze data streams. This approach is increasingly used in areas such as customer segmentation, targeting, recommendation systems, touchpoint optimization, and content adaptation. Within this framework, mechanical AI contributes to the acceleration of operational processes by enabling the automatic execution of repetitive tasks. Thought-based AI supports decision-making processes by analyzing large datasets and provides businesses with stronger insights. Emotional AI helps establish more meaningful and relationship-oriented communication by analyzing human emotions and interaction patterns. This three-pronged distinction demonstrates that algorithmic marketing is not merely an automation-based structure, but also a reshaping of marketing thinking in a more measurable and data-driven direction (Huang & Rust, 2021).

With the advancement of technology, the contribution of artificial intelligence integrated into marketing processes is explained not by its complete replacement of managers, but by its support and strengthening of their decision-making processes (Davenport et al., 2020). This approach reveals that collaborative decision-making mechanisms, which utilize both human intuition and AI-based analytical capabilities, play a significant role in improving marketing performance.

Data-driven marketing forms the fundamental information infrastructure of this algorithmic approach. Today, marketing activities are no longer limited to sales records or CRM data kept within the business. Multi-layered data streams from various sources such as mobile applications, social media platforms, digital interactions, sensors, Internet of Things (IoT) devices, and online behavioral traces have become an integral part of marketing processes. With this development, data has ceased to be merely an element reporting past performance and has become a strategic resource enabling the prediction of consumer preferences and the real-time management of customer touchpoints. It is stated that new technologies offer significant advantages to companies in terms of accessing big data sources and managing customer experience in a more advanced way. However, it is also pointed out that these technological developments bring some risks in terms of security and privacy. Similarly, in the literature, Zhang and Watson emphasize that in today's marketing environment, consumer data is increasingly moving beyond firm boundaries, and businesses

need more advanced analytical tools to make sense of this dispersed data ecosystem (Grewal et al., 2020, Zhang & Watson, 2020).

Big data and machine learning form the fundamental operating mechanism of this data-intensive structure. Machine learning models are not only used as classification or prediction tools in marketing; they also function as a discovery mechanism that reveals patterns in customer behavior that cannot be directly observed. Therefore, in the modern marketing infrastructure, data collection, data processing, and decision-making processes have ceased to be independent stages and have transformed into a decision cycle that is constantly fed by a flow of data and can update itself. This situation shows that the position of the consumer in the marketing system has also changed. The consumer is no longer considered only as a "target audience," but as an active actor who constantly generates data through different platforms and devices. Indeed, Puntoni and his colleagues also demonstrate that consumer interactions with artificial intelligence occur at different levels such as data capture, classification, transfer, and social experience, emphasizing that the algorithmic infrastructure is directly related not only to internal company efficiency but also to the structuring of the consumer experience (Puntoni et al., 2021).

The third crucial dimension of this technological architecture is the platform economy. Platforms function not merely as distribution channels or digital storefronts within the marketing ecosystem, but as centralized structures that manage data flow, regulate interactions, and shape market visibility through algorithms. Therefore, the platform logic leads to the emergence of a new value creation system that transcends the traditional firm-customer dichotomy and operates through multilateral, data-connected, and networked effects. Digital ecosystems are defined through the interdependencies created by data connections, and it is emphasized that in these structures, firms now compete not only with the products they offer but also with the data generated by those products. In this context, it is stated that digital ecosystems significantly transform the value creation area, the scope of competition, and the sources of monopoly power (Subramaniam, 2020). Similarly, it is noted that traditional businesses need to develop a "digital customer orientation" in order to adapt to digital ecosystems. This approach is making it increasingly inevitable for businesses to produce richer, more holistic, and personalized customer experiences through platforms and data streams (Kopalle et al., 2020).

Therefore, the algorithmic infrastructure of modern marketing can be better understood by considering three fundamental layers together: algorithmic marketing, where decisions are optimized through computational systems; data-driven marketing, which refers to the data system that feeds these decisions; and the platform economy, which enables the circulation of all these processes. When

these three structures are considered together, marketing ceases to be merely a function that designs messages and becomes a holistic socio-technical system capable of collecting data, generating predictions, organizing interactions, and distributing visibility. In such an environment, competitive advantage is based not only on the ability to produce creative content or identify the right target audience, but also on organizational capabilities that can process data, train algorithms, and strategically position themselves within platform ecosystems (Huang & Rust, 2021, Zhang & Watson, 2020; Subramaniam, 2020).

3. AI-Driven Consumer Experience and Personalization

In the current phase of digital marketing, consumer experience is no longer considered solely the result of a single interaction with a product or message. Instead, the experience is shaped within a multi-layered interactive structure constructed across data streams, predictive systems, recommendation engines, conversational interfaces, and immersive digital platforms. Therefore, the classic touchpoint approach alone is insufficient to explain consumer experience; a more comprehensive framework is needed that takes into account the time-extended, multi-channel, and dynamic nature of the experience. Indeed, customer experience is considered as the sum of cognitive, emotional, behavioral, sensory, and social responses that occur across the touchpoints offered by the company, and it is emphasized that this experience is a holistic process extending to pre-purchase, purchase, and post-purchase phases (Lemon & Verhoef, 2016, Puntoni et al., 2021).

In this context, AI-driven personalization refers to the transformation of personalization in marketing from an adaptation based on fixed segments to a dynamic form of relationship that is constantly updated based on the consumer's past behaviors, current preferences, and contextual data. Huang and Rust demonstrate that artificial intelligence operates on the “standardization–personalization–relationalization” axis in marketing activities and, particularly thanks to its pattern recognition capacity, can generate recommendation systems, cross-selling mechanisms, and adaptive personalization strategies that are updated over time. In the same study, the distinction between static personalization and adaptive personalization is important for explaining the logic of hyper-personalization in contemporary marketing. In this context, personalization does not only mean “offering similar content to similar customers”; it also relies on a decision-making mechanism that is constantly recalibrated with longitudinal customer data (Huang & Rust, 2021). The process that Puntoni and colleagues define as “classification experience” also makes this transformation visible from the consumer's perspective. Accordingly, the consumer becomes an actor exposed to personalized predictions generated about

them by algorithms, in other words, someone who is classified and guided according to this classification (Puntoni et al., 2021).

From this point, algorithmic consumer experience demonstrates that the experience is not limited solely to the presentation of personalized content; it also shows that the consumer's decision-making process is progressively structured by algorithms. Puntoni and colleagues examine the consumer's relationship with artificial intelligence in four experiential dimensions: data provision, classification, task delegation, and social interaction. This approach reveals that algorithmic consumer experience not only produces functional conveniences but also brings with it psychological tensions such as control, autonomy, misunderstanding, alienation, and trust. In particular, personalized predictions and automated suggestions partially relieve the consumer of the burden of decision-making while simultaneously invisibly shaping their preference architecture. Therefore, algorithmic experience should not be considered a neutral technical tool that provides convenience to the consumer, but rather a marketing infrastructure that actively regulates the cognitive and emotional framework of the experience (Puntoni et al., 2021, Lemon & Verhoef, 2016).

Conversational marketing constitutes one of the most visible touchpoints of algorithmic consumer experience. Chat interfaces operating through websites, social media platforms, and messaging applications transform marketing communication from one-way message transmission into a real-time, interactive, and responsive structure. This enables businesses to communicate with consumers more quickly and in a personalized way, while also managing the customer experience within a more fluid and continuous interaction process.

It has been noted that chatbots not only provide cost and time advantages in customer service but also function as a social interface influencing user engagement and feedback tendencies, particularly with verbal anthropomorphic design cues and perceived social presence leading users to view the chat agent not merely as a technical tool but as an interactive social actor (Adam et al., 2021).

This situation demonstrates that the success of conversational marketing is related not only to technical accuracy but also to the extent to which the interaction offers a human-like experience. Indeed, within the framework presented by Huang and Rust, customer service and front-line customer interaction are evaluated within the dimensions of “feeling AI” and “relationalization.” This perspective shows that conversational interfaces are not merely question-answering systems; they are also interaction tools that personalize and enhance the quality of the relationship established with customers (Huang & Rust, 2021, Adam et al., 2021).

4. Cognitive and Behavioral Consequences for Consumers

One of the significant problems consumers face in the digital marketing environment is that the amount of information they are exposed to can exceed their cognitive processing capacity. Information overload literature refers to a cognitive strain that occurs when the amount of information an individual encounters exceeds their processing capacity. Studies in the field of consumer behavior also show that this situation can reduce decision quality, increase confusion, and make the decision-making process more tiring in online purchasing processes. Especially in the web environment, both insufficient and excessive information presentation can negatively affect individuals' attention and evaluation processes. Therefore, it is emphasized that simply providing more information is not enough for better decision-making; how the information is structured and presented is at least as important as its quantity (Eppler & Mengis, 2004, Chen et al., 2009, Sicilia & Ruiz, 2010).

In this context, digital information fatigue is considered not only a result of intense information exposure, but also a state of exhaustion created by the pressure to be constantly online and the uninterrupted flow of content on digital platforms. Research on social media fatigue reveals that users tend to withdraw from platforms when faced with a large number of content, connections, and interaction demands. More recent studies show that information overload and cognitive load stemming from system characteristics increase emotional exhaustion, which in turn exacerbates social media fatigue. Therefore, in the consumer behavior literature, digital fatigue is considered not only a temporary discomfort related to media use, but also a psychological consequence affecting an individual's attention level, evaluation processes, and willingness to remain on the platform (Bright et al., 2015, Sheng et al., 2023).

One of the most prominent behavioral consequences of this cognitive approach is advertising avoidance. Early studies in the field of internet advertising showed that factors such as content that makes it difficult to reach the target audience, perceived confusion, and past negative experiences were prominent among the reasons why consumers avoided ads. Later research revealed that advertising avoidance in digital environments is not limited to simple reactions such as closing or ignoring the ad. Consumers sometimes interrupt the shopping process, move away from distracting content, or develop more cautious attitudes towards ad-supported platforms. Therefore, advertising avoidance behavior is considered not a passive indifference to marketing messages, but rather an active coping strategy developed by the consumer against cognitive overload and perceived interference (Cho & Cheon, 2004, Bang et al., 2018, Khan et al., 2022)

Another important concept in consumer psychology, advertising skepticism, has been defined as a general tendency of consumers to distrust and be unwilling to believe advertising claims, and has been shown to be a measurable, relatively stable consumer trait. Subsequent studies have shown that individuals with high levels of advertising skepticism may have more negative attitudes towards advertisements; this can weaken brand belief, attention to the advertisement, and willingness to benefit from the advertisement. Therefore, advertising skepticism is considered not only as a negative reaction to a specific advertisement, but also as a more persistent form of attitude associated with the strengthening of persuasive information and which can erode the credibility of the advertisement (Obermiller & Spangenberg, 1998, Obermiller et al., 2005).

The concepts of filter bubble and echo chamber, prominent in discussions of algorithmic information environments, evaluate these cognitive and behavioral responses within a broader information ecosystem. The fundamental debate in this literature is how the interaction between platform algorithms and user networks with similar views can narrow the variety of content individuals encounter and strengthen information flows that reinforce those views. Kitchens, Johnson, and Gray argue that a simple "yes or no" approach is insufficient to address these phenomena; more nuanced analyses considering content diversity and shifts in ideological orientation are needed. The study also demonstrates that such environments, where information flow is restricted, are shaped not only by user preferences but also by platform architecture and recommendation systems. This discussion is also important from a marketing perspective, as the variety of products, brands, and messages consumers encounter is increasingly determined by the same algorithmic selection and ranking mechanisms (Kitchens et al., 2020).

In conclusion, when the concepts discussed in this section are considered together, the impact of digital marketing on the consumer cannot be explained solely by more accurate targeting or higher engagement. Information overload can trigger digital fatigue; digital fatigue can strengthen ad avoidance behavior; and ad skepticism can weaken the persuasive power of marketing messages. The discussions on filter bubbles and echo chambers also reveal how these individual responses are shaped within a broader algorithmic information environment. Therefore, the fundamental issue in the consumer behavior literature is not so much the extent to which digital marketing tools are personalized, but rather how these personalization processes reshape the consumer's attention, trust, and choice horizon (Eppler & Mengis, 2004, Obermiller et al., 2005, Kitchens et al., 2020).

Table 1. Key Concepts in Artificial Intelligence and Algorithm-Based Marketing Literature

Concept	Approach	Key Author, Year	Findings
Filter Bubble	Algorithmic Personalization	Pariser, 2011	Algorithmic filtering systems can reduce information diversity by causing users to encounter only content with similar viewpoints.
Echo Chambers	Digital Communication And Media	Sunstein, 2001	When individuals with similar views interact within the same information environments, it can lead to the repetition of ideas and the pushing of opinions to more extreme positions.
Selective Exposure	Media Choice And Consumer Psychology	Stroud, 2011	Individuals tend to prefer content that aligns with their existing beliefs, and this can reinforce information homogenization in digital environments.
Social Media Polarization	Social Media Network Analysis	Cinelli et al., 2021	The clustering of users in ideologically similar communities on social media platforms can amplify the echo chamber effect.
Algorithmic Marketing	Artificial Intelligence And Marketing	Davenport et al., 2020	AI-powered systems can automate marketing decisions, optimizing segmentation, pricing, and ad targeting.
Data-Driven Marketing	Marketing Analytics	Wedel & Kannan, 2016	Big data and analytics models can improve marketing performance by enabling data-driven marketing decisions.
Personalized Online Advertising	Digital Advertising	Bleier & Eisenbeiss, 2015	While personalized ads can increase consumer interest, excessive personalization can raise privacy concerns.
Artificial Intelligence in Service	AI And Service Marketing	Huang & Rust, 2021	Artificial intelligence technologies can transform customer experience and service processes, creating new ways of value creation.
Advertising Skepticism	Consumer Psychology	Obermiller & Spangenberg, 1998	Consumers' skepticism towards advertisements can reduce the credibility and persuasive power of advertising messages.
Advertising Avoidance	Advertising Behavior	Speck & Elliott, 1997	As the intensity of advertising increases, consumers may develop advertising avoidance behaviors.
Information Overload	Digital Information Environment	Eppler & Mengis, 2004	An increasing amount of information can overwhelm individuals' cognitive capacity, reducing the quality of their decisions.
Digital Information Fatigue	Digital Media Usage	Bright et al., 2015	Continuous consumption of digital content can lead to cognitive fatigue and reduced platform usage in individuals.
Algorithmic Gatekeeping	Media And Algorithms	Naples, 2014	Algorithms can control the flow of digital information by determining which information is displayed to the user.
Algorithmic Amplification	Platform Algorithms	Gillespie, 2018	Platform algorithms can influence information distribution by increasing the visibility of certain content.

Hypernudge	Behavioral Economics And Algorithms	Yeung, 2017	Algorithmic systems can guide user behavior with finely tuned digital nudges.
Digital Choice Architecture	Behavioral Marketing	Johnson et al., 2012	Digital interface designs can significantly influence users' decision-making processes.
Dark Patterns	User Experience	Gray et al., 2018	Some digital interface designs can subtly steer users towards certain behaviors.
Attention Economy	Digital Media Economy	Davenport & Beck, 2001	Digital platforms optimize content flow by viewing user attention as an economical resource.
Recommender Systems	Recommendation Algorithms	Ricci et al., 2015	Recommendation systems analyze user behavior to provide content and product recommendations.
Platformization	Platform Economy	Poell et al., 2019	Digital platforms have become central actors in media and marketing ecosystems.
Surveillance Capitalism	Data Economy	Zuboff, 2019	Digital platforms have created a new model of capitalism by transforming user behavior data into economic value.
Datafication	Data Society	Mayer-Schönberger & Cukier, 2013	Transforming human behavior into data is one of the fundamental processes of the digital economy.
Social Proof	Social Impact	Cialdini, 2009	Individuals tend to make decisions by referencing the behavior of others.
Trust in Online Systems	Digital Security	Gefen et al., 2003	Trust in online platforms can influence consumers' digital purchasing behavior.
Algorithmic Bias	AI Ethics	O'Neil, 2016	Algorithms can reproduce biases in datasets, leading to unequal results.
Explainable AI	AI Transparency	Adadi & Berrada, 2018	Explainable artificial intelligence systems make algorithmic decisions understandable.
Platform Governance	Digital Platform Management	Gorwa, 2019	The content moderation and algorithmic management processes of platforms have given rise to new governance discussions.
Algorithmic Harms	Digital Platform Effects	Tufekci, 2015	Algorithmic systems can pose risks in terms of the spread of misinformation and societal impacts.
Engagement Optimization	Social Media Algorithms	Tufekci, 2015	Platform algorithms optimize content flow to increase user engagement.
Exposure Diversity	Social Media Provides A Diversity Of Information.	Bakshy et al., 2015	Social media algorithms can limit the variety of information users encounter.

5. Discussion and Conclusion

The rapid progress in digital technologies has not only led to the emergence of new tools in the marketing discipline but has also substantially transformed the fundamental logic of marketing. This transformation, particularly through data-intensive infrastructures, algorithmic decision-making systems, and AI-driven applications, enables marketing processes to become more predictable, automated, and customized. Today, marketing activities are no longer limited to producing creative communication or evaluating consumer needs; instead, they

are shaped within a holistic socio-technical system capable of collecting data, processing data, generating predictions, and managing consumer engagements in real time (Davenport et al., 2020, Huang & Rust, 2021).

Advances in digital technologies have led to data-driven approaches and algorithm-based systems becoming increasingly central to marketing. Studies in the literature show that AI-powered algorithms not only automate marketing processes as well as enable the formation of more targeted and customized marketing strategies through analyzing consumer behavior (Davenport et al., 2020; Huang & Rust, 2021). Thanks to big data analytics and algorithmic marketing applications, enterprises can analyze consumer preferences in more detail and integrate this data into marketing decision making processes (Wedel & Kannan, 2016).

However, the proliferation of algorithmic systems in marketing and digital media environments has sparked substantial debate over how information flows and visibility are shaped. In particular, algorithmic filtering mechanisms can limit information diversity by inducing users to encounter only content with similar views. This situation is explained in the literature with the concept of the filter bubble, and it is stated that algorithms can reduce users' access to different perspectives through customized content delivery (Pariser, 2011). Similarly, the echo chamber effect is associated with the reinforcement of opinions and increased polarization as individuals mostly interact with people who have similar views in digital environments. In this context, the selective exposure tendency is also explained by individuals' preference for content that supports their current beliefs, which may contribute to increased information homogeneity in digital environments (Stroud, 2011).

The regulation of content flow on digital platforms by algorithms is addressed in the literature with the concepts of algorithmic gatekeeping and algorithmic amplification. The algorithmic gatekeeping approach discloses that platform algorithms can control the flow of information by determining which content is shown to users (Napoli, 2014). Furthermore, algorithmic amplification mechanisms can influence information distribution by increasing the visibility of specific content and transforming the structure of the digital public sphere (Gillespie, 2018). In this process, algorithmic optimization strategies intended to increase user interaction on social media platforms also play an important role (Tufekci, 2015).

The design features and user interfaces of digital platforms also shape consumer behavior. In the literature, the concepts of digital choice architecture and hypernudging are used to explain how digital environments can guide users' decision-making mechanisms (Johnson et al., 2012; Yeung, 2017). Furthermore, the fact that some platform designs subtly steer users towards certain behaviors

is discussed within the framework of the dark patterns concept (Gray et al., 2018). Such practices raise important ethical issues concerning marketing strategies.

On the other hand, the increasing data collection and processing capacity of digital platforms has led to the emergence of new areas of discussion within the data economy. The continuous transformation of consumer behavior into data is explained by the concept of datafication, while the use of this data in the production of economic value is evaluated within the surveillance capitalism framework (Mayer-Schönberger & Cukier, 2013; Zuboff, 2019). In this context, digital platforms have ceased to be merely communication channels in the marketing ecosystem and have become central actors in data-driven economic activities (Poell et al., 2019).

The proliferation of algorithm-based systems also brings ethical and governance dimensions to the forefront. The reproduction of inequalities arising from the datasets used by algorithms is accounted for by the concept of algorithmic bias, which is considered a major societal risk associated with digital platforms (O'Neil, 2016). Similarly, the social effects of algorithmic systems are discussed within the framework of algorithmic harms (Tufekci, 2015). Therefore, explainable AI approaches are gaining importance in order to make algorithms more transparent and understandable, and the explainability of algorithmic decision-making processes is emphasized (Adadi & Berrada, 2018). In addition, platform management and regulatory mechanisms are critical to content distribution and algorithm management in the digital ecosystem (Gorwa, 2019).

However, alongside the opportunities offered by algorithmic marketing, the risks arising from ethical and governance dimensions are also noteworthy. Issues such as data privacy, algorithmic bias, the explainability of decision-making processes, and corporate transparency are increasingly discussed in the marketing literature today. The fact that consumer data has become a fundamental resource for marketing strategies may also increase privacy concerns and make the trust relationship between the consumer and the brand more fragile. Therefore, it is emphasized that algorithmic systems should be evaluated not only through technical performance metrics but also within the framework of ethical responsibility and accountability (Huang & Rust, 2021).

Overall, algorithmic marketing provides robust tools for accurately predicting consumer behavior and managing customer experience more effectively. However, the long-term success of these technologies depends on factors beyond analytical precision or automation capabilities. Consumer perceptions, trust regarding algorithmic systems, and transparency in decision-making processes are essential for the sustainability of marketing practices. Consequently, future research should examine algorithmic marketing applications not merely as

technological innovations but within a holistic framework that encompasses consumer experience, psychological reactions, and ethical regulation.

In this context, algorithmic marketing represents a new paradigm within the marketing discipline. The sustainability of this paradigm relies on sustaining a balanced relationship between technological advancement and consumer trust. Principles such as transparency, ethical data use, and explainable algorithms should be regarded not only as regulatory requirements but also as essential components that improve social acceptance of marketing activities and encourage long-term consumer relationships.

In conclusion, studies in the literature show that AI and algorithm-based marketing applications are driving significant change in the marketing discipline. This transformation offers businesses significant opportunities, such as better analysis of consumer behavior, the provision of customized content, and more efficient marketing processes. However, this process also discusses various risks, such as reduced information diversity, algorithmic bias, data privacy, and ethical issues. The holistic evaluation of the concepts discussed in this study adds to the systematic presentation of approaches scattered across the algorithmic marketing literature. Furthermore, this framework provides a basis for a more in-depth examination of the managerial and societal impacts of AI-supported marketing applications in future studies.

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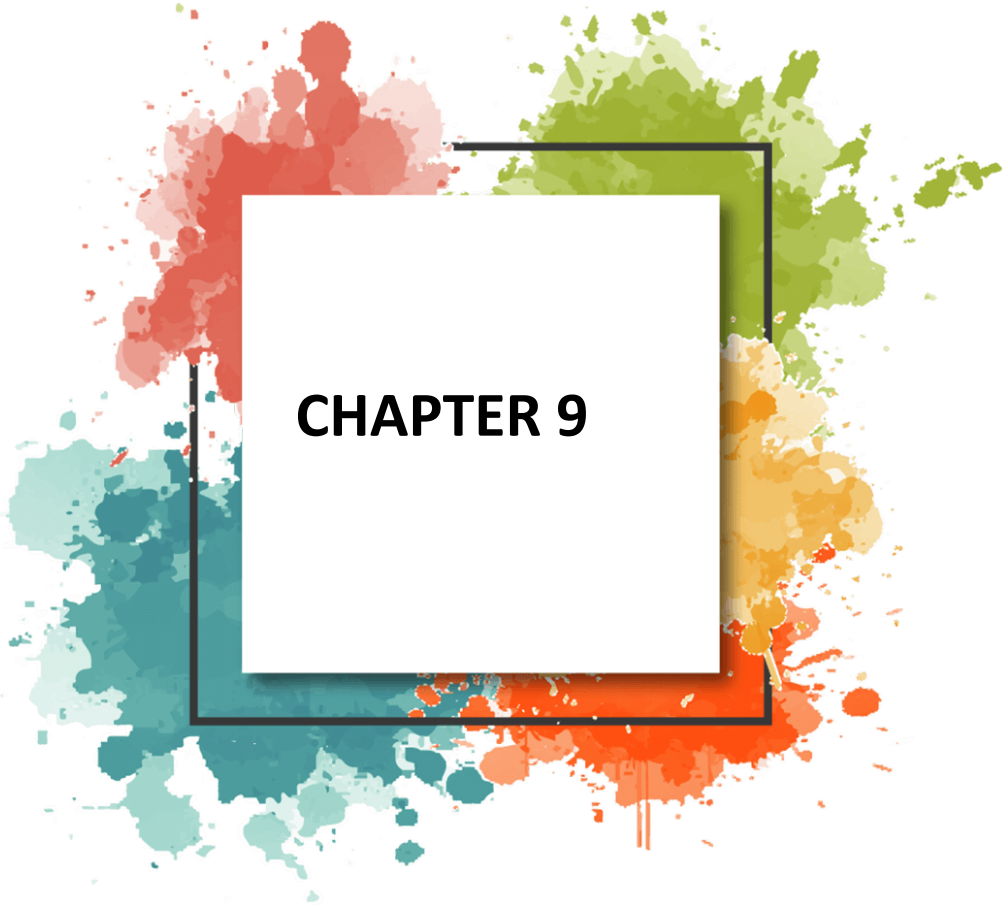
CHAPTER 9

A Comparative Study of the 9th Grade English Curriculum in Secondary (Vocational) Schools in Turkey and the Netherlands

Suna Yaşar[1] *& Hasan Hüseyin Şahan*[2]

Introduction

Globalization is a multidimensional phenomenon. Giddens (1990) defines globalization as "the intensification of worldwide social relations that link distant localities in such a way that local happenings are shaped by events occurring many miles away, and vice versa." In the technological age we live in, it has become almost impossible for societies to remain independent of one another. Individuals from different nations and cultures are in constant contact and collaboration across economic, political, social, and cultural domains. However, the differences in native languages increase the need for a common medium of communication within this intensive interaction. Based on this need, English is observed to be the language most frequently used by people from different countries to communicate. Firth (1990) refers to this language, used by non-native English speakers for the purpose of mutual communication, as "English as a Lingua Franca" (ELF).

Today, English, which has emerged as a common means of communication, is positioned as a contemporary foreign language in many countries. When examining language policies in Europe, it can be said that the Council of Europe has adopted an approach in the field of education that supports multilingualism, linguistic diversity, and foreign language learning (Council of Europe [CE], 2020). One branch of this structure, the European Centre for Modern Languages, is an institution that aims to support the implementation of language policies in practice and to disseminate innovative approaches to the learning and teaching of modern languages. In coordination with the Language Policy Programme, the Common European Framework of Reference for Languages (CEFR) has been developed to establish a common ground across Europe in areas such as language teaching curricula, curriculum guides, examination systems, textbooks, and similar domains (CE, 2020).

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The aim of the Common European Framework of Reference for Languages (CEFR), which was created to determine the goals and outcomes of foreign language teaching, is to explore and define how a language can be used in social, educational, and professional contexts. Within this scope, the "Framework" comprehensively structures what language learners need to know and at what level in order to communicate effectively in the target language. At the same time, this document serves as a general reference source that specifies the levels and competencies necessary to measure the achievements of language learners throughout their lifelong learning and at every stage of the educational process, as well as the limitations, standards, and possibilities of language teaching. By serving as a foundational resource in the field of foreign language education, the Framework aims to ensure that all citizens of the Council of Europe can achieve social cohesion, engage in intercultural interaction, and participate in multilingual education in a consistent manner. The CEFR levels and objectives are presented in Table 1.

Table 1. Global Foreign Language Proficiency Scale

Advanced User	C2	Can easily understand almost everything he/she hears or reads. He/she can summarize information from different oral and written sources and reconstruct arguments and narratives coherently. He/she can express him/herself spontaneously, very fluently, and accurately, and can distinguish subtle nuances of meaning even in more complex situations.
	C1	Can understand a wide range of demanding and longer texts, and grasp implicit meaning. He/she can express him/herself fluently and spontaneously without much obvious searching for expressions. He/she can use the language flexibly and effectively for social, academic, and professional purposes. He/she can produce clear, well-structured, detailed texts on complex subjects, using organizational patterns, connectors, and cohesive devices with control.
Intermedıate User	B2	Can understand the main ideas of complex texts on both concrete and abstract topics, including technical discussions in his/her field of specialization. He/she can interact with native speakers with a degree of fluency and spontaneity that makes regular interaction possible

		without strain for either party. He/she can produce clear, detailed texts on a wide range of subjects, explaining a viewpoint on a current issue and giving the advantages and disadvantages of various options.
	B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. He/she can deal with most situations likely to arise while traveling in a region where the language is spoken. He/she can produce simple connected texts on familiar or personal interest topics. He/she can describe experiences and events, dreams, hopes, and ambitions, and briefly give reasons and explanations for opinions and plans.
Basıc/Begınner User	A2	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g., very basic personal and family information, shopping, local geography, work). He/she can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. He/she can describe in simple terms his/her background, immediate environment, and matters in areas of immediate need.
	A1	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g., very basic personal and family information, shopping, local geography, work). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms his/her background, immediate environment, and matters in areas of immediate need.

As seen in Table 1, the CEFR classifies language proficiency into six levels: A1, A2, B1, B2, C1, and C2. These levels are often grouped into three main

categories in most sources: Basic User (A1–A2), Independent User (B1–B2), and Proficient User (C1–C2).

In addition to the CEFR, which is used to measure language proficiency, some organizations assess and compare English proficiency levels across countries and systematically monitor language teaching and learning processes. One such organization is Education First (EF). Since 2011, EF has published the English Proficiency Index (EPI) report annually. This report measures the English proficiency of participants aged 18 and above, and the findings are reported by country, region, age, and gender, ranking the countries accordingly.

Although effective foreign language teaching is officially declared as a strategic goal by the Ministry of National Education of Turkey (https://www.meb.gov.tr/yabanci-dil-egitimi-bizim-icinstratejik-bir-meseledir/haber/18557/tr), statistical results reflect that significant success has not yet been achieved in this area. According to statistics published by Education First in 2025, Turkey ranked 71st in the Global English Proficiency Index and, with an average score of 488, was second to last among European countries. Turkey's English Proficiency Index rankings over the years are presented in Table 2.

Table 2. Turkey's English Proficiency Index Rankings Over the Years

Years	2025	2024	2023	2022	2021
Participated Countries	123	116	113	111	112
Turkey's Ranking	71	65	66	64	70
Proficiency Level	Low	Low	Low	Low	Low

An examination of evaluations conducted over the past five years shows that, as of 2021, Turkey's proficiency level was updated as low. According to the 2025 EF EPI report, the Marmara and Aegean regions received the highest scores, while the region with the lowest proficiency level was the Eastern Anatolia region. The difference between the highest and lowest scores among the regions was 54 points. The Top Five Countries with Very High English Proficiency are presented in Table 3.

Table 3. Top Five Countries with Very High English Proficiency in the English Proficiency Index

	2025	2024	2023	2022	2021
1.	The Netherlands	The Netherlands	The Netherlands	The Netherlands	The Netherlands
2.	Croatia	Norway	Singapore	Singapore	Austria
3.	Austria	Singapore	Austria	Austria	Denmark
4.	Germany	Sweden	Denmark	Norway	Singapore
5.	Norway	Hırvatistan	Noway	Denmark	Norway

An examination of Table 3 shows that between 2021 and 2025, the country with the highest proficiency was the Netherlands. Over the past five years, among more than one hundred countries, the country that has maintained the first position consecutively for five years draws attention for its foreign language education.

For many years, various deficiencies in foreign language education have been debated in Turkey. Despite significant efforts, time, and resources allocated at both public and individual levels in line with Westernization goals, many schools have not achieved the desired outcomes in foreign language teaching and learning. This ongoing issue indicates that foreign language education needs to be reconsidered and improved. Foreign language teaching is an integral part of the general education system, and the influence of language on societal life can be clearly observed across all dimensions of culture (Uygur, 1984).

Today, to evaluate the success of language education, some organizations measure and compare English proficiency levels across countries and systematically monitor the teaching and learning processes. One such organization is Education First (EF). According to EF's English Proficiency Index (EPI) report, which has been published annually since 2011, the 2025 study—conducted with approximately 2.2 million participants—places Turkey 71st out of 113 countries with a low proficiency level. In the same ranking, the Netherlands holds the 1st position with a very high proficiency level (Education First [EF], 2025). The proficiency rankings of these countries over the past three years are presented in Table 4.

Table 4. EF EPI Rankings of the Netherlands and Turkey Over the Years

	The Netherlands	Turkey
2025	1. (Very High Level)	71. (Low Level)
2024	1. (Very High Level)	65. (Low Level)
2023	1. (Very High Level)	66. (Low Level)

According to Table 4, looking at the rankings of the countries in 2024 and 2025, the Netherlands remains in 1st place, while Turkey ranked 65th in 2024 and 71st in 2025. The Netherlands maintains a stable position with a very high proficiency level. Although Turkey's ranking has changed, its proficiency level remains low.

In Turkey, curricula prepared by the Board of Education and Discipline (Millî Eğitim Bakanlığı Talim ve Terbiye Kurulu) are implemented at the national level. Within this framework, Turkey has a detailed and nationally valid Secondary Education English Curriculum (Eurydice, 2023).

In contrast, the Netherlands does not have a detailed and centralized curriculum like the one in Turkey. However, general learning outcomes have been established for the education system. The Ministry of Education, Culture and Science (OCW) and the Netherlands Institute for Curriculum Development (SLO) set educational goals and framework curricula, and regularly conduct research and publish reports on the functioning of the system. School boards are responsible for the quality of education and for achieving the established goals. Accordingly, school boards and teachers have the authority to adapt curricula to their local conditions (Eurydice, 2023). The objectives and framework documents provided by SLO guide teachers on which areas to emphasize in student development.

From the perspective of the administrative dimension and implementation of curricula, there is a clear need to compare the education systems of the two countries, especially in the field of foreign languages, given that the Netherlands has consistently ranked at the top in the EF EPI while Turkey's foreign language education shows lower outcomes.

There are numerous studies comparing the Turkish education system with those of other countries. Among these studies: Ergun and Ersoy (2016) examined the primary school teacher training systems in the Netherlands, Romania, and Turkey; Ertem, (2023) investigated becoming an English teacher in the Netherlands and Turkey; Şahin and Aykaç (2019) analyzed primary school

foreign language curricula in European countries and Turkey; Solak (2013) compared foreign language teaching in primary schools in Finland and Turkey, and Aydın, Başer and Kılınç (2024) conducted a comparative study of secondary education English curricula in Turkey, France, and the Netherlands.

Within the literature, no study has specifically examined the 9th-grade English curriculum in vocational secondary schools in Turkey and the Netherlands in terms of curriculum elements. A study that compares the Netherlands' 9th-grade secondary education English curriculum—corresponding to VMBO levels 3 and 4 within the Dutch education system—with the 9th-grade English curriculum under Turkey's Century of Education Model (TYMM), implemented in 2024, and highlights their similarities and differences, is expected to provide valuable perspectives to educators, policymakers, and experts working in curriculum development, thereby contributing to the field.

Additionally, comparing the secondary education English curricula in Turkey and the Netherlands is important for identifying the strengths and areas for improvement of English teaching programs in both countries, as well as for revealing the strengths, weaknesses, and gaps of the implemented English curricula. Within this framework, the study aimed to identify the reasons behind the Netherlands' success in foreign language education by conducting a comparative analysis of the 9th-grade English course curricula in vocational high schools in Turkey and the Netherlands, highlighting their similarities and differences.

In this study, the following sub-questions were addressed. In the 9th-grade English curriculum of Turkish vocational high schools and the corresponding VMBO levels 3 and 4 English curriculum in the Netherlands:

1.What are the similarities and differences in terms of the objectives?

2.What are the similarities and differences in terms of the content?

3.What are the similarities and differences in terms of teaching and learning processes?

4.What are the similarities and differences in terms of assessment and evaluation?

Method

Research Model

This study aims to conduct a comparative analysis of the 9th-grade English curriculum prepared within the framework of Turkey's Century of Education Model (TYMM) and the secondary-level English curriculum within the Dutch education system in terms of curriculum elements. Comparative education is defined as a discipline that examines the education systems of different countries in a multidimensional manner, aiming to identify similarities and differences between them and to develop solutions to similar problem areas through comparisons (Tatlı & Adıgüzel, 2012).

The study is designed based on an inter-country comparative education approach, adopting the horizontal comparative research model among comparative research designs. Accordingly, the curricula of both countries were analyzed simultaneously in terms of objectives, content, teaching and learning processes, and assessment and evaluation, and similarities and differences were systematically identified.

As this study was conducted using a qualitative research method, a case study design, one of the qualitative research approaches, was adopted.

Data Collection and Analysis

In this study, which aims to compare the 9th-grade English curriculum in Turkish vocational high schools with the foreign language (English) curriculum at the 9th-grade-equivalent level of Dutch pre-vocational secondary education (VMBO levels 3 and 4), the document analysis technique was employed for data collection. Within this framework, the study examined the 9th-grade English curriculum implemented in 2024 under Turkey's Century of Education Model (TYMM) and the Waymark textbooks used in vocational high schools. Data sources were created by reviewing official institutional websites, laws and regulations, library resources, national and international databases, theses, articles, conference papers, and official reports.

Document analysis, defined as the examination of written materials containing information about the phenomenon(s) under study (Karakaya, 2009), was applied in five stages in this research: accessing the documents, verifying authenticity, understanding the documents, analyzing the data, and using the data in the study (Yıldırım & Şimşek, 2008).

The data obtained were analyzed using the descriptive analysis technique. For this purpose, the data were examined and compared based on the dimensions of objectives, content, teaching and learning processes, and assessment. The

findings were interpreted within the context of each country's education system and discussed in accordance with the literature on comparative education**.**

Validity and Reliability

In qualitative research, validity refers to the measures taken to ensure accurate and trustworthy information, while reliability refers to presenting the research process and data in a clear, detailed, and transparent manner so that it can be evaluated by other researchers (Yıldırım & Şimşek, 2008). In this study, the criteria of credibility (internal validity), transferability (external validity), dependability (internal reliability), and confirmability (external reliability) were applied to ensure validity and reliability.

The studies examined in this research consist of articles and theses prepared in accordance with scientific standards. Once data appropriate to the research purpose were obtained, the previously determined themes were restructured during the content analysis process to encompass relevant concepts. Concepts and themes were presented to the reader without any subjective interpretation. The coding process was carried out by multiple researchers, and inter-coder agreement was checked. Additionally, the raw data, coding procedures, and results were reviewed by an external expert to obtain feedback. Different types of publications (articles, master's theses, and doctoral theses) underwent similar stages of analysis.

Furthermore, the reliability of the study was calculated using the formula provided in Qualitative Data Analysis (1994). Reliability= Number of agreements
Number of agreements + Number of disagreements\text{Reliability} = \frac{\text{Number of agreements}}{\text{Number of agreements + Number of disagreements}}Reliability=
Number of agreements + Number of disagreementsNumber of agreements. The reliability coefficient was determined to be 0.94, indicating high reliability.

Findings and Discussion

Objectives

The Turkish Secondary Education English Curriculum has been updated within the framework of Law No. 1739 on National Education and in line with the holistic educational philosophy offered by the Turkey Century of Education Model (TYMM). While the program's objectives and learning outcomes continue to align with CEFR standards, the language learning process is no longer viewed solely as acquiring technical skills; it has been designed to support the development of a "competent and virtuous human" profile.

The core structure and objectives of the new program have been updated as follows: Within the Virtue-Value-Action Framework, language education aims not only to develop students' cognitive skills but also to cultivate individuals capable of translating values into action and possessing moral maturity. Under the Holistic Personality Development approach, the main goal of the program is to guide students to use English accurately and effectively, while also nurturing them as individuals endowed with the qualities of rationality, empathy, and aesthetic sensibility.

Within the K12 Skills Framework, language instruction is integrated with the framework established by the Ministry of National Education, offering 21st-century skills such as critical thinking, problem-solving, and social contribution on a moral foundation. In terms of the learning environment, the program provides more than a stimulating and enjoyable setting; it positions language learning as a process of personal development and a bridge between civilizations, fostering students' national identity while enhancing their competencies on a global scale (MEB, 2025).

The CEFR-based 9th-grade Turkish secondary education English curriculum model created under the TYMM framework is presented in Table 5.

Table 5. Objectives of the 9th-Grade English Curriculum in Turkish Secondary Education

School Type	Level	Skill	Final Objectives
Vocational High School	Independent User (B1.1)	Reading	The learner identifies the main idea in clear and straightforward texts related to daily life. They distinguish important details in texts on familiar topics. Using contextual clues, they infer the approximate meaning of unknown words. They follow cause-and-effect relationships within the text and scan for information such as dates, times, locations, and prices. They recognize the purpose of the text and interpret the basic connections between paragraphs.
	Independent User (B1.1)	Listening	The learner understands the main idea in standard and clear speech on familiar topics. They identify basic information in daily dialogues, such as "who/what/where/when/why". They follow short announcements and instructions at a general comprehension level. In fast speech, they catch key words to grasp the overall meaning. When listening to the same content again, they fill in missed points and develop understanding of details. They recognize the speaker's main

		attitude.
	Independent User (B1.1)	Speaking	The learner gives a 1–2 minute unrehearsed speech on familiar topics. They express their experiences, plans, and feelings using simple but coherent sentences. They illustrate and clarify their ideas with examples. Despite basic pronunciation or stress errors, they maintain comprehensible speech. They initiate, maintain, and appropriately close everyday conversations. When they do not understand, they use patterns for requesting repetition or clarification. They participate in simple discussions, stating agreement or disagreement and giving brief reasons. In situations such as travel, shopping, or dining, they express needs, ask questions, and respond appropriately.
	Independent User (B1.1)	Writing	The learner writes coherent short paragraphs on familiar topics. They narrate an event or experience in chronological order. They express their own opinion and support it with at least one or two reasons. They write short emails or messages using purpose, details, and requests appropriately. They use past, present, and future tenses at a basic level correctly, and even if there are errors, comprehensibility is maintained. They ensure textual flow using simple connectors. They review and correct their writing for basic errors.

The 9th grade is structured as Regular Upper Secondary – Level: B1.1, with each theme planned for 14 lesson hours. The content is integrated with target vocabulary, grammar, pronunciation, and social language expressions. Examination of Table 5 indicates that the objectives at the end of the 9th-grade English course focus on enabling students to communicate effectively.

Table 6. Objectives of the Secondary Education English Curriculum in the Netherlands

School Type	Level	Skill	Final Objectives
VMBO GL&TL&KB	Beginner User (A2)	Reading	The learner can understand short, simple texts on familiar and concrete topics, written in commonly used everyday language or work-related language. They can comprehend short, simple texts that contain frequently encountered vocabulary, including some shared international terms. Given a specific information need, they can identify which relevant information a text contains. They can determine the main idea of a text (or section) and understand the meaning of its key elements. They can compare data from one or more texts and draw conclusions. They can identify connections between sections of a text.
		Listening	The learner can predict the most likely continuation of a conversation.
		Speaking	The learner can respond appropriately in common social interactions, such as greetings. They can give and request information, ask for opinions/judgments and provide their own views or decisions, and express and inquire about personal feelings. They can also describe a person, object, or event from the past or future.
		Writing	The learner can provide personal information. They can write brief notes to convey thanks, greetings, or good wishes. They can write notes to request or provide information, make or respond to requests or offers, and express or request feelings.

English is a mandatory subject for all learning pathways in pre-vocational secondary education (VMBO) (Netherlands Institute for Curriculum Development [SLO], 2024). The findings presented in Table 6 indicate that, as in Turkey, the Dutch secondary education English curriculum focuses on language skills (reading, writing, listening, speaking) and communicative functions. The

program objectives are structured according to specific skills.Similar to the Turkish secondary education English curriculum, students in the Netherlands are classified according to the user categories defined in the CEFR. However, unlike in Turkey—where these categories remain consistent across skills—Dutch students are expected to reach different proficiency levels for different skills. Furthermore, target levels vary according to school type: for Pre-vocational Secondary Education (VMBO) students, the expected level is Basic User (A2).

Unlike Turkey, the Netherlands does not provide gradual level targets by class year; instead, the expected outcomes are defined for the completion of secondary education. Moreover, these targets are not explicitly included within the curriculum itself, but are specified in exam programs published by SLO. The Modern Foreign Languages learning area emphasizes "communicating with confidence", encompassing the processes of receiving, interpreting, and producing oral/written, verbal/non-verbal information in the target language. Within this framework, reading, listening, speaking, spoken interaction, writing, and written interaction are considered the core language skills (SLO, 2025).

When examining the secondary education English curricula of Turkey and the Netherlands, it is evident that in both countries, objectives are structured based on the Common European Framework of Reference for Languages (CEFR). Therefore, a brief overview of the CEFR is necessary:

The CEFR defines six broad proficiency levels, ranging from the lowest, A1, to the highest, C2. Students are classified into three main groups according to these levels: Basic User (A1–A2), Independent User (B1–B2), and Proficient User (C1–C2). This classification reflects an approach that considers not only students' knowledge of the language but also their ability to use it for communication and to develop communication strategies.

The CEFR describes learners' proficiency in detail across five core language skills: Spoken Interaction, Spoken Production, Listening, Reading, and Writing. For each level, there are detailed "can-do" statements related to these skills. By distinguishing speaking as both interaction and production, the CEFR emphasizes both language production and the ability to participate effectively in communication (CE, 2020).

Content

When examining the secondary education English curricula of both countries, the content and topic headings by grade level in the Turkish curriculum are presented in Table 7.

Table 7. Themes of the 9th-Grade English Curriculum in Turkey

Theme	Functions
School Life	**-Introduces oneself and one's country using basic information.** **-Uses expressions conveying "ability/capability" and "possibility."** **-Engages in short question-and-answer dialogues about countries and cultural elements.**
Class Life	-Describes daily routines and study habits. -Compares routines and expresses how often they do something using time expressions. -Discusses plans and habits in classroom interactions.
Personal Life: Physical Appearance and Personality	-Describes a person's physical and personality traits. -Uses expressions indicating "degree" or "extent" to make evaluations. -Engages in short descriptive and comparative conversations.
Family Life	-Introduces family members' professions and workplaces. -Correctly expresses the relationship between profession, workplace, and job duties. -Asks and answers questions about jobs/professions and gives short introductions.

Life at Home and Neighborhood	-Describes types of houses and rooms using basic vocabulary. -Asks and answers questions such as “Where do you live?” or “What kind of house do you have?” -Describes activities or tasks being done at home.
Life in the City and Country	-Offers food/activity options and helps the other person make a choice. -Distinguishes between habitual/general actions and actions happening “right now” when describing events. -Gives and obtains information about festivals/foods and makes simple comparisons**.**
Life and Nature in the World	-Describes endangered animals and their habitats; provides basic information. -Talks about and asks questions regarding situations at a specific time in the past. -Uses language to give suggestions and express responsibilities for protection**.**
Life in the Universe and the Future	-Introduces film genres and describes “what happens” in a film. -Expresses predictions and expectations about the future with supporting reasons. -Gives viewing recommendations and makes suggestion sentences.

As seen in Table 7, the themes are structured according to the 9th-grade level. When examining the language functions, it is observed that the largest number of functional language structures are concentrated at the 9th-grade level to help students reinforce the gains acquired in the previous education stage and to

provide a stronger foundation for higher grades. The program includes eight themes, with the functional language structures in each theme ranging from 2 to 5. In addition, for each theme, the curriculum provides detailed guidance on language functions, grammatical structures, sentence patterns, and vocabulary, as well as recommended materials and activities. These comprehensive guidelines indicate that teachers in Turkey have relatively limited autonomy in the processes of content creation and delivery. Furthermore, within the Turkey Century Maarif Model, the program incorporates the themes of "competent and virtuous individual" and "virtue–value–action."

The content and subject headings according to the secondary education level in the Netherlands are presented in Table 8.

Table 8. English Course Themes in VMBO Levels 3 and 4 in the Netherlands

Theme		Functions
Basic Language Skills	Listening	The learner understands daily conversations, short announcements, and simple dialogues**.**
	Reading	Short texts, emails, notices, and online content
	Speaking	Introducing oneself, asking questions, and communicating in everyday situations
	Writing	Writing short messages, emails, filling out forms, and simple paragraphs
Personal Life Themes	Introducing oneself	Name, age, school, hobbies
	Family and friends	Members of family, relationships

Daily Life	School Life	Lessons, curriculum, and school rules
	Daily routines	Daily activities
Social Life	Hobbies and free time	Sport, music, games
	Shopping	Asking about a product, finding out the price
Social and Environmental Topics	Travel	Asking for directions, transportation
	Enviroment and Health	Basic environmental issues, healthy living
Assesment	National Exam (Eindexamen)	Reading-focused centralized exam
	CEFR levels	Generally A2 – B1 target level

In the Netherlands, unlike in Turkey, specific content and topic headings for each grade level are not defined in detail; instead, reference is made to thematic areas provided as examples within the CEFR framework. This indicates a more flexible curriculum structure compared to Turkey. Similarly, in VMBO, content is not presented as a fixed list of topics but is organized around communicative competencies. Schools can design their own teaching materials within this framework. The VMBO English course is structured according to language skills and communication contexts rather than fixed "theme lists"; schools and teachers teach English around meaningful topics such as daily life, school, hobbies, shopping, and travel in accordance with this framework (SLO, 2025).

Teaching and Learning Processes

The teaching and learning processes of the English curriculum at the secondary education level in Turkey and the Netherlands are presented in Table 9.

Table 9. Comparison of the Teaching and Learning Processes of the English Curriculum for 9th Grade Vocational High Schools in Turkey and VMBO Levels 3 and 4 in Pre-Vocational Secondary Education in the Netherlands

Dimension	Turkey	The Netherlands
Program Philosophy	Skill-based, value-oriented, holistic education approach	Communicative competence and CEFR-aligned language instruction
Target	Ability to communicate in everyday life and basic vocational contexts	Functional communication in daily and vocational contexts; exam preparation
Dil Düzeyi (CEFR)	B1.1	A2 (approaching B1 in some streams)
Approach	CLT + task-based learning; project-based learning, skills integration	CLT + task-based learning; exam-strategy focused in 4th grade
Skills	Listening and speaking prioritized; four skills balanced	Reading skill prioritized (due to central exams)
Grammar	Context-driven inference; structure serves as a tool	Functional framework; in practice, structure-oriented approach is more prominent
Vocabulary	High-frequency vocabulary + domain awareness	Thematic vocabulary instruction + vocational/occupational terminology
Activities	Role-play, information gap, paired speaking, short production tasks	Text analysis, exam questions, controlled dialogues
Class organization	Collaborative learning, group work	Individual and pair work; exam practice

Materials	Textbook + EBA digital content	Textbook + sample exam booklets
Technology Integration	Smart board, digital content, online activities	Digital exam applications
The Role of Teacher	Guide, facilitator, supporter of value transmission	Guide + exam strategy instructor
The Role of Learner	Active participant; collaborative learner	Strategic reader; individual responsibility
Professional Connection	At the 9th grade, basic level; in upper grades, preparation for subject-specific English	Prominent in grades 3–4; strong work/internship context

As shown in Table 9, in Turkey's secondary education English program, besides using CEFR as a reference for foreign language teaching, the Türkiye Yüzyılı Maarif Model (TYMM) creates a learning ecosystem with a holistic approach that addresses the intellectual, social, emotional, physical, and moral development of the individual. It is a student-centered approach that emphasizes active student participation, supports deep learning in meaningful contexts through flexible and enriched learning experiences adapted to diverse needs, and places research and inquiry at the center to help students structure their knowledge and skills while integrating knowledge, skills, dispositions, and values for holistic development.

Aligned with the holistic program perspective and the assumptions underlying the program, the selected learning approaches can be applied across different disciplines and weights, and can be implemented using teaching methods and techniques that support them. The main approaches adopted are experience-based, project-based, context-based, inquiry-based, and collaborative learning (MEB, 2025). Due to the centralized structure of the Turkish education system, teachers have limited autonomy in the teaching and learning processes.

Although CEFR is also used as a reference in foreign language teaching in the Netherlands, schools are given broad autonomy regarding teaching approaches and the selection of instructional materials; each school is free to choose its own methods and resources. There is no mandatory centrally prescribed teaching methodology for English; instead, schools develop their own pedagogical approaches based on national objectives, and the teaching–learning processes are determined at the school level.

The development, marketing, and distribution of teaching materials are largely handled within a commercial framework. To help schools make informed choices, the Ministry of Education publishes a guide that comparatively evaluates the quality of materials available on the market for each subject area. In addition, the National Information Centre for Learning Materials (NICL), affiliated with the National Curriculum Development Institute (SLO), prepares guides to help schools compare existing and new materials. Teachers also have direct access to various online resources for different courses, and some schools may seek support from these institutions when adapting national objectives to their daily lesson plans (Eurydice, 2023c).

In the Netherlands, the secondary school English curriculum does not prescribe step-by-step teaching procedures; rather, it provides guidance within the CEFR framework. However, based on evaluations conducted by the Ministry (SLO, 2025), a variety of resources and activities are used to develop speaking, listening, reading, and writing skills. All teachers include speaking practice in their classes, but the frequency and scope of these practices vary considerably from teacher to teacher. Many teachers systematically incorporate speaking skills into their lesson plans; in some classes, practices occur weekly, while in others, they may be scheduled once every three to four weeks. During oral exam periods, the practice frequency can increase to up to three times per week. Common practices include short ten-minute speaking activities each week, dedicating one or two lessons per term entirely to speaking skills, and activities such as brief speeches, games, visual description exercises, drawing described visuals, practicing with speaking cards, discussing books or articles, and short in-class presentations (SLO, 2025).

In the Dutch education system, teachers' freedom in lesson planning is based on the design of the curriculum as a "framework program" rather than a rigid set of instructions. This structure provides teachers with broad flexibility to adapt the lesson content, methods, and delivery process according to the individual characteristics of their students. The curriculum is not a detailed content list that must be implemented identically in all schools; rather, it represents a set of expected learning outcomes. This allows the program to be flexibly adapted to the needs of a particular school or region.

When planning lessons, teachers can focus on students' interests, abilities, and learning needs, and they are free to select the most appropriate content rather than follow a prescribed sequence. Additionally, because the program does not mandate specific methods or techniques, decisions about how to conduct instruction are left to the teacher's professional expertise and pedagogical judgment. In classes with students of varying proficiency levels, teachers design diversified activities tailored to student levels to strengthen classroom management and increase engagement, thereby effectively structuring the teaching–learning process (SLO, 2025).

In both the Turkish and Dutch education programs, the CEFR serves as a fundamental reference framework guiding the teaching process in line with the targeted language skills and learning outcomes, including the selection of resources, activity patterns, methods, and techniques. While the materials used and classroom activities vary from country to country, the common trend is a clear prioritization of developing communicative competence. The most detailed guidance regarding class levels and themes is found in Turkey's secondary education English curriculum. In the Netherlands, due to the freedom granted to teachers to shape the curriculum, the teaching–learning processes are not prescribed in detail; however, it can be stated that teachers structure the process by incorporating CEFR-recommended activities, methods, and techniques into their lessons.

Assessment and Evaluation

The assessment and evaluation dimension of the English curricula at the secondary education level in Turkey and the Netherlands is presented in Table 10.

Table 10. Comparison of the Assessment and Evaluation Dimension of the English Curriculum for 9th Grade Vocational High Schools in Turkey and VMBO Levels 3–4 in Pre-Vocational Secondary Education in the Netherlands

Dimension	Turkey	The Netherlands
Assessment Philosophy	Process-oriented, performance- and skill-based; assessment encompasses not only outcomes but also the learning process.	Focused on centralized exams (especially in the 4th level); both in-school assessments and exam results are jointly determinative.
Assessment Tools	Written exams, oral assessments, performance tasks, portfolios, project work	Centralized written exam questions (reading-focused), in-school tests, oral and written performance tasks.

Assessed Skills	Listening, speaking, reading, writing (the four skills); balance of skills is considered throughout the process.	Reading skill (dominant in the context of the centralized exam), writing, listening, and speaking may be included in in-school assessments.
Assessment Criteria	Achievement criteria are based on learning outcomes; rubrics and open-ended assessments are used.	In the centralized exam, multiple-choice and short-answer questions are used; in school-based assessment, rubrics and standard forms are applied.
Performance Tasks	Real-life language tasks, presentations, group projects, student portfolios.	In-class oral presentations and writing tasks; no traditional performance tasks in the central exam.
Feedback	Continuous and qualitative; feedback primarily focuses on enhancing student learning.	In-class feedback is provided; however, individual progress analysis based on centralized exam results is more limited.
Use of Digital Assessment	Digital assessment, online writing/listening tests, digital portfolios.	Practice digital exams; centralized digital exam applications (widely used nationwide).
Assessment According to Vocational Context	Language use in vocational contexts is assessed through performance tasks.	In vocational contexts, assessment is less emphasized in exams; it may be contextualized in in-school evaluations.
Assessment Reporting	Feedback-oriented reporting; evaluates the student's learning and development process.	Score-focused reporting; centralized exam results play a significant role.

Within the framework of the Turkey Century Education Model (TYMM), the assessment and evaluation approach for English (foreign language) courses in secondary education is built on a formative structure that places skills at the center and monitors the learning process step by step with the aim of developing the student. The goal here is not merely to record the "outcome" with a grade at the

end of the term, but to regularly track students' progress in language skills and deepen learning through qualitative feedback.

According to TYMM, assessment and evaluation in English courses are primarily planned to cover both the core and supporting skills defined in the curriculum's learning outcomes. In this framework, receptive skills—represented through listening and reading, which reflect the "comprehension" dimension—reveal the extent to which students understand the language. Productive skills—represented through speaking and writing, which reflect the "production" dimension—make visible the students' ability to use the language meaningfully and effectively. Additionally, foreign language supporting skills such as grammar, vocabulary selection/use, and pronunciation are incorporated into the assessment process as complementary elements that reinforce the main skills (MEB, 2025).

The model emphasizes continuous monitoring of student development rather than limiting assessment to one-off exams. Accordingly, various "learning evidences" are collected to reflect student performance; examples of these evidences include portfolio work, performance tasks, presentations, self- and peer-assessments, and reflective writing. It is expected that at least one performance task is assigned for each theme or unit, and these tasks are designed to be realistic, meaningful, and connected to the students' lives. Additionally, for skills such as writing or speaking, progress through the process stages is systematically monitored by the teacher, who provides targeted feedback to guide the student to the next level (MEB, 2025).

Another element shaping the assessment approach in TYMM is the learning pathways used in instruction. Because language is addressed holistically in authentic communicative practices and through inductive processes where students discover and construct linguistic structures, different cognitive processes are engaged, and assessment criteria are structured accordingly. Evaluation can therefore be conducted holistically, semi-holistically, or inductively. Students' readiness levels are also considered before instruction begins; prior knowledge and basic assumptions are identified, allowing teaching and assessment processes to be differentiated. Reporting and technology are also integral components of the system. Student performance is analyzed not only in relation to their classroom position but also comparatively against their own prior progress and broader benchmarks. In performance-based assessments, the use of digital tools is encouraged; technology-supported methods such as simulations, scenario design applications, and educational games are viewed as opportunities to make students' skills more realistic and visible (MEB, 2025).

In Dutch secondary schools, CEFR-based examination programs focus on assessing students' reading, listening, speaking, and writing skills according to

their language proficiency levels. The SLO emphasizes the importance of a formative (developmental) approach in assessment, publishing sample applications and guidance materials for teacher use (SLO, 2025). Moreover, schools in the Netherlands are able to design their own exams, decide the proficiency level at which students will be assessed, select which skills (e.g., reading) will be tested, and determine the rubrics and relative weighting of different skills. Teachers also typically choose discussion topics for tests that align with the target CEFR level (SLO, 2025).

A research report examining the language proficiency levels of secondary school students indicates that not all teachers grade speaking skills; among those who do, it is usually assessed only once or twice a year. In some schools, speaking is evaluated during the "language village" project conducted in the third year, while in others, students are assessed through language tasks such as filming a short movie, preparing a brochure, or giving an English-guided tour in their local area. Additionally, some teachers prefer providing qualitative feedback rather than assigning a numerical grade. In speaking assessments, students sometimes discuss a current topic with or without preparation, and occasionally in written form. About half of the teachers give unprepared speaking tasks, while a smaller number engage students in more open-ended speaking activities. Some teachers have students describe images or videos, whereas others ask students to read texts of their own choosing (Levende Talen, 2019). Overall, the findings show that practices vary significantly from school to school and from teacher to teacher.

In Turkey, within the framework of the TYMM, the assessment and evaluation dimension of the English course is explicitly defined in the program as a skill-based and process-oriented framework. Receptive skills (listening/reading) and productive skills (speaking/writing), along with supporting competencies such as grammar, vocabulary, and pronunciation, are addressed together. Each theme or unit includes performance tasks, collection of portfolios and various "learning evidences," as well as tools like self- and peer-assessment and reflective writing to monitor progress and deepen learning through feedback (MEB, 2025).

In the Netherlands, although assessment focuses on the four core skills in line with CEFR levels, the program provides less detailed guidance than Turkey, emphasizing school and teacher autonomy. Schools can design their own exams, select which skills to assess, determine rubrics, and set the weighting of skills. While SLO provides example guides for formative assessment, practices vary from school to school, and areas such as the frequency of grading speaking skills show notable differences (SLO, 2025; Levende Talen, 2019).

Comparatively, assessment in Turkey is more centralized, standardized, structured, and evidence-based, whereas in the Netherlands, even though CEFR

guides the goals, assessment is more flexible, shaped according to the local context, and more dependent on teacher initiative.

Discussion, Conclusion, Recommendations

This study shows that in both countries, the CEFR is used as a common reference framework; however, there are notable differences in how objectives are designed, the level of content detail, the guidance of teaching–learning processes, and assessment practices. In the Netherlands, the central focus in the modern foreign languages domain is "communicating with confidence," and communication is defined through the processes of receiving, interpreting, and conveying input in the target language, both orally and in writing. The core skills are considered as reading, listening, speaking/speaking interaction, and writing/written interaction.

In Turkey, vocational high schools structure objectives and content in a more gradual and detailed manner according to grade level; this structure is coordinated with textbooks, providing teachers with a more "defined" instructional pathway. This finding aligns with the results of studies by Mustafa (2011), *A Comparative Study of Primary Foreign Language (English) Curricula in Turkey, Germany, and the Netherlands*, and Şahin & Aykaç (2019), *A Comparison of Foreign Language Curricula in European Countries and Turkey*.

In contrast, in the Netherlands' pre-vocational secondary education (VMBO levels 3 and 4), the targeted proficiency can vary according to school type, and the objectives are primarily visible through exam programs rather than the curriculum text. Additionally, it is considered normal for students to achieve different competency levels across skills. This difference produces the advantage of a standardized progression and traceability in Turkey, whereas in the Netherlands it increases adaptability for teachers and schools, while also expanding the diversity of implementations and the resulting need for consistency.

In terms of content, Turkey's program provides themes and language functions for 9th grade explicitly and separately by grade level (8 themes; 2–5 functional language structures per theme), offering detailed guidance on grammar, sentence patterns, vocabulary, and suggested materials/activities. Additionally, it makes a value-based framework visible. This finding aligns with Çelik (2015) in *A Comparative Study of Secondary English Curricula in Turkey and the Russian Federation* and with the study by Demirel, Gümüştekin, and Yazgünoğlu (2010), *A Comparison of Fourth-Grade English Curricula in Turkey and Germany (Bremen Example)*. In the Netherlands, however, content is not structured as detailed topic lists by grade level; instead, it follows CEFR-referenced example topic areas, indicating a more flexible program design.

In terms of teaching and learning processes, the TYMM explicitly references pedagogical approaches such as experience-based, project-based, context-based, inquiry-based, and collaborative learning, thereby strengthening instructional guidance. In Turkey, this is further supported by components like CLIL & Culture, project work, reflection/self-assessment, e-portfolio, and rubric-based evaluation; for example, students are expected to complete process-oriented tasks such as producing videos, uploading them to an online portfolio, conducting peer assessments, and engaging in self-reflection.

In the Netherlands, however, the teaching approach and material selection rely on school and teacher autonomy. Since the educational materials market operates largely commercially, schools are supported in their choices through structures such as NICL (National Information Centre for Teaching Materials), which provides comparative guidance. The program itself directs schools toward CEFR frameworks rather than detailing the learning-teaching process. This autonomy allows for quick adaptation and diversification according to classroom needs, but it also leads to variability in practices from teacher to teacher, such as the frequency and scope of speaking activities (e.g., weekly 10-minute speaking exercises, periodic speaking lessons, games, visual descriptions, speaking cards, short presentations, etc.).

In the area of assessment and evaluation, the differences between the two countries become even more evident. In Turkey, within the TYMM framework, assessment is explicitly defined in the program and establishes a formative structure that integrates receptive skills (listening/reading), productive skills (speaking/writing), and supporting skills. Each theme or unit includes performance tasks, portfolios, and other "learning evidence", as well as self- and peer-assessment and reflective practices.

In the Netherlands, although there is a goal to assess the four core skills based on the CEFR, the design of exams, level selection, skill weighting, and rubrics are determined by schools and teachers. While SLO provides example guides, practices vary. Reports indicate that not all teachers grade speaking skills, and those who do usually do so only once or twice a year. In some schools, speaking is assessed through projects such as "language village" activities, film-making, brochure creation, or guided tours, and some teachers prioritize feedback over numerical grades. The findings suggest that this flexibility in assessment in the Netherlands provides a favorable environment for authentic tasks, but because the frequency and scope of evaluation are not standardized, the comparability of learning outcomes depends largely on local decision-making processes.

Overall, under the TYMM framework, Turkey's 9th-grade English program provides a detailed roadmap for teachers by specifying goals, content, learning experiences, and assessment components according to grade level, while making

a process-oriented and evidence-based assessment approach visible within the program text. In the Netherlands, although the CEFR serves as a common reference framework, the program functions more as a flexible "framework", and school/teacher autonomy is more pronounced; decisions regarding content, methods, materials, and assessment are made at the local level, resulting in greater diversity of practices. Considering the study's limitations (i.e., Turkey's focus on 9th-grade vocational high schools under TYMM; the Netherlands' focus on VMBO levels 3–4), these findings provide strong insights for a specific context, but caution should be exercised when generalizing.

For Turkey, while preserving the program's detailed and structured features (theme-based content, process-oriented assessment, and collection of learning evidence), "elective modules" or alternative material pools could be developed to allow teachers some flexibility to adapt content and activities to the local context. This would balance standardization with pedagogical flexibility. Additionally, the systematic use of e-portfolios, peer assessment, and rubrics could be expanded at the school level to integrate formative assessment more firmly into classroom routines. It is recommended that teachers be granted more autonomy in content and method selection, and that assessment processes be diversified according to local context, similar to the teacher-freedom models in the Netherlands. Although the CEFR is applied in both countries, Turkey's relatively "low" proficiency levels suggest that discussion should focus more on implementation and teacher autonomy rather than program design details.

For the Netherlands, without compromising autonomy, minimum common standards could be established particularly regarding frequency of speaking assessment, skill weighting, and basic rubric principles. Sharing best practices and creating a common language for assessment could reduce inter-school disparities that affect learning equity.

As a recommendation for researchers and policymakers, ensuring that communication-focused goals (such as confident communication and authentic language tasks) are sustainably implemented depends on continuous professional development in assessment literacy, rubric design, and classroom speaking/interaction planning. Therefore, it is advisable that policymakers and administrators increase in-service training opportunities to support teachers in these areas.

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