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Editorial and Reviewers' Board

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The current issue is the fourth of the eleventh volume of the *Athens Journal of Business & Economics (AJBE), published by the Business & Law Division and the Economics Unit of Athens Institute.*

Gregory T. Papanikos
President
Athens Institute

20th Annual International Symposium on Economic Theory, Policy and Applications 29-30 June & 1-3 July 2026, Athens, Greece

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- Dr. Henry Thompson, Head, Economics Unit, Athens Institute & Emeritus Professor, Auburn University, USA.
- Dr. Chris Sakellariou, Head, Economics Unit & Associate Professor of Economics, Nanyang Technological University, Singapore.

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- Abstract Submission: **25 November 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **1 June 2026**

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Important Dates

- Abstract Submission: **30 September 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **6 April 2026**

Academic Member Responsible for the Conference

- **Dr. Gregory T. Papanikos**, President, Athens Institute.
- **Dr. Michael P. Malloy**, Director, Business, Economics and Law Division, Athens Institute & Distinguished Professor & Scholar, University of the Pacific, USA.
- **Dr. David A. Frenkel**, LL.D., Head, Law Research Unit, Athens Institute & Emeritus Professor, Law Area, Guilford Glazer Faculty of Business and Management, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

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Anti-Net Zero Narratives in the UK

By Peter Jones[*]

In the global struggle to address climate change, a commitment to net zero emissions has become part of the corporate mantra, but net zero is also seen as a contested agenda. While the UK has been cast as one of world leaders in the drive to a net zero future, little has been published in the academic business and management literature on anti-net zero thinking in the UK. This paper looks to explore some of the organisational and individual narratives of anti-net zero in the UK, and thus to make a small contribution to helping to fill that gap in the literature. The author also explores a number of more general issues, namely the impact of net zero in the business world, the growth opportunities associated with net zero, the role of technology, the importance of behavioural change, net zero under capitalism and future research agendas, in a concluding discussion.

Keywords *Net Zero; Anti-Net Zero; Counter Climate Movement; Anthropogenic; Capitalism.*

Introduction

The concept of net zero emissions, a state in which greenhouse gases, principally carbon dioxide, passing into the atmosphere are balanced by their removal from the atmosphere, has increasingly become part of the corporate mantra, in the fight against climate change. Amongst the major consumer facing companies in the UK, Tesco (2024), for example, argued *'we aim to be carbon neutral in our Group operations by 2035 and net zero across our full value chain, aligned to a 1.5°C trajectory, by 2050'*, while Apple claimed to be *'working to bring our net emissions to zero across our entire carbon footprint'* (Apple 2024). In part these commitments reflect consumer facing companies increasing awareness of the need to respond to widespread, though not universal, consumer concerns about the impact of climate change. In part, they also reflect political pressure from the UK government for companies to reduce their greenhouse gas emissions.

However, The D Group (2024), a leading cross-sector strategic development network in the UK, argued that *'Net Zero is now part of the mainstream debate in national politics. As a result, it is also becoming a more contested agenda.'* Tobin and Paterson (2024), for example, charted out the changing political dynamic around climate change in the UK and argued that while some opposition to climate policy has been long standing in the UK, it is only since 2021, that *'a backlash has been organised against net zero',* and that since that time that a group of Conservative MPs began to speak and publish widely against net zero as a goal in

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itself and created the Net Zero Scrutiny Group. That said, while the UK has been cast as one of world leaders in the drive to a net zero future, little has been published in the academic business and management literature on anti-net zero thinking in the UK.

With this in mind, this short paper looks to harness elements of the DeSmog (2024) 'Climate Disinformation Database' to explore some of the narratives of anti-net zero in the UK, in two ways. Firstly, a simple exploratory examination of the positions on climate change adopted by some of the organisations and individuals listed in the database, allows a general review of the anti-net zero narratives. Secondly, a selective examination of the websites of a small number of the organisations in the database, allows a more detailed focus on some of the specifics of anti-net zero narratives Such a review seems timely, in that while 'net-zero is the dominant lens through which countries, states and regions, cities and companies approach carbonisation' (Net Zero Tracker 2022), an examination of alternative perspectives and positions, may help to enhance the wider understanding of, and responses to, climate change in the business world. The paper includes a summary of the origins and characteristics of the net zero concept, a brief review of the relevant literature, outline details of the method of enquiry, an exploration of some of the themes that constitute anti-net zero narratives within the UK, and a short concluding discussion.

Characteristics and Origins of the Net Zero Concept

Net zero greenhouse gas emissions represent the balance between the amount of such gases produced in, and the amount removed from, the atmosphere, and net zero is reached when the amount added is no more than the amount removed. Lang (2024), writing under the Energy and Climate Intelligence Unit banner, argued that *'the concept of net zero has come a long way in a very short time - it has gone from science to policy to mainstream in less than a decade'*, but with any eye to the future suggested that *'it's the three decades ahead, particularly the first, that will determine whether the new window through which decarbonisation is now viewed globally delivers what it promises.'* Fankhauser et al. (2021) argued that *'the concept of net-zero carbon emissions has emerged from physical climate science'* but that *'it is operationalized through social, political and economic systems.'*

International policies on reducing greenhouse gas emissions are rooted in the Kyoto Protocol, and the Paris Agreement. The Kyoto Protocol, which was adopted in 1997, but due to a complex ratification process only came into force in 2005, committed industrialised countries and economies in transition, to limit or reduce greenhouse gas emissions in accordance with agreed individual targets. The Paris Agreement came into force in 2016, and the vast majority of the world's countries committed themselves to limit the rise in global warming to well below 2°C, and to pursue efforts to limit it to 1.5°C, which would effectively see greenhouse gas emissions fall to net zero by 2050.

That said, meeting such targets presents a number of major economic, political and social challenges. On the one hand, for example, setting net zero targets, may well disrupt existing business models and challenge vested economic interests. Economically, within current global market models net-zero will need to be to be incorporated into market mechanisms, and here the focus, in part at least, will need to be on investment in renewable and low carbon power generation. At the same time, there may be challenges for governments in maintaining political commitment and consensus, and they may deem it necessary to provide a variety of incentives to encourage and facilitate the transition to net zero emissions. On the other hand, people may need to change many of their consumption behaviours, and more particularly to, adopt behaviours and to adopt modes of consumption that lead to lower energy demands. More generally, moving to net-zero will require cutting greenhouse gas emissions across the economy. However, the consensus is that in some industries, particularly aviation, it will be very complex, and very expensive, to completely cut emissions, and thus emissions may need to be removed from the atmosphere. Here the focus may need to be on either changing how we use our land so it can absorb more carbon dioxide, or by carbon capture, which essentially would involve extracting carbon directly through new technologies.

Literature Review

A brief Internet search designed to outline the academic literature on anti-net zero, was conducted on Google Scholar and employed the key term anti-net zero. The vast majority of the academic literature on net zero greenhouse gas emissions is supportive of the net zero concept in that looks to examine how a wide range of mechanism and policies can reduce net emissions quickly and defectively. However, three anti-net zero themes can be identified within the literature.

Firstly, there has been a recognition that of the challenges of transitioning to net zero under capitalism. Kaptan (2024) emphasised '*the antagonism between net zero and the capitalist economy* ', while Adler (2022), claimed that the climate crisis called for a *'massive and rapid retooling of our economy and society',* and argued there were reasons to doubt that *'capitalism, even reformed, could meet that challenge.'* Hall and Davis (2021) claimed that the scale of greenhouse gas removal necessary to avoid dangerous climate change warrants *'the use of grand interpretive theories of how the global economy operates'*, and argued that *'critical social science should be able to name the global economy as capitalism'*, and that *'instead of speaking about transforming the global economy as a necessary precondition for limiting climate change, instead speak about transforming, or even transcending, capitalism.'*

Secondly, there has been growing academic interest in the counter climate change movement. Farrell (2016), for example, recognised that anthropogenic climate change posed a major threat to global human well-being and to the functioning of ecosystems, but argued that understanding of the causes of widespread uncertainty about climate change remained limited. In an attempt to

explore such causes, Farrell employed network science in an attempt to uncover the institutional and corporate structure of the climate change counter movement and machine learning text analysis to show its influence in the news media and in bureaucratic politics. The author's work revealed that that the organizational power within the counter movement and the magnitude of semantic similarity, were both are both strongly linked with the elite corporate benefactors.

McKie (2018) explicitly recognised that *'climate change is one of the most pressing issues facing the* world', and argued that *'despite the scientific consensus on climate change and its impacts, an organized group of actors have campaigned, distorted, and minimized the impacts of climate change criticizing domestic and international policy approaches to address the adverse effects of climate change. This group of actors is more commonly referred to as the Climate Change Counter Movement.'* McKie claimed that the climate change movement had been a topic of interest for social scientists and environmentalists for over 25 years and that it had played that *'an influential role in negotiating public policy and influencing public opinion on behalf of fossil fuel and corporate actors.'*

More specifically, McKie (2019) employed neutralisation theory to examine the composition of the messages adopted by the Climate Change Counter Movement, and how these messages had changed over time, and argued that their examination provided valuable insights into the environmental harm facilitated by such messages. By way of conclusion, McKie suggested that it the provision of further insight into the arguments adopted by the Climate Change Counter Movement could play 'a vital role in environmental policymaking, influencing public and political attitudes on climate change.' Which might be seen to further enhance the rationale for the present paper. Three years later, in a much more extensive text, McKie (2023) provided a historical account of the emergence and spread of the Climate Change Counter Movement across the globe, drawing on her own extensive database, to explore the movement's organisation in different countries.

Work on the Climate Change Counter Movement has also been undertaken on a geographical basis. Brulle (2019), for example, claimed that the climate change countermovement in the US had been important in delaying efforts to address climate change, and looked to examine the structure of key political coalitions, and their allied trade associations, in opposing climate action. His findings revealed that these coalitions pooled resources from a large number of corporations to mount sophisticated political and cultural campaigns to oppose efforts to address climate change. Almiron et al. (2020) undertook a similar exercise in six countries within Europe, and their results revealed a consistent contrarian framing through think tanks in the European Union, and a proliferation of contrarian outputs in recent years.

Thirdly, an emerging body of published work in the social sciences (e.g. Hunger and Paxton 2024: Beveridge et al. 2024) on right wing populism seems to offer some potentially valuable insights. Here, in addressing anti-net zero in the UK, Patterson et al. (2023) claimed to have introduced the term *'anti-net zero populism'* to explore the *'ideological and opportunistic movements working to undermine climate policy.'* Further, Paterson et al. (2023) looked to construct a conceptual framework based on *'policy dismantling'* and *'discursive opportunity*

structures', and then examined the framework against six policy areas, including fracking, heat pumps, renewable energy resources, electric vehicles, the petrol and diesel ban and traffic neighbourhoods, involved in the pursuit of net zero. More specifically, Paterson et al. (2023) identified a number of *'attacks on the goal of net zero',* including attacks on the goal of net zero per se, as well as attacks on the six policy areas listed above, and by way of conclusion, argued that *'the rise of backlash to climate policy in the UK provides important evidence that institutional mechanisms to stabilise climate policy are not sufficient to lock in transitions*.'

However, prior to the publication of Paterson et al.'s (2023) work, Akins (2022) offered a commentary designed to trace *'how right-wing populist politicians and commentators have linked net-zero policies to a cost-of-living crisis, characterising decarbonisation as an undemocratic pursuit, and affirming the need to accelerate policies that enable the fracking of natural gas.'* This commentary looked to explore how in right-wing populist politicians and commentators in the UK linked net zero policies to a cost of living crisis and which characterised decarbonisation as an undemocratic pursuit and affirmed the need to accelerate policies to encourage fracking.

Fiorino (2022) argued that in recent years the Republican Party in the US had taken on the characteristics right wing populism and that this had an effect on climate mitigation policy, not least in that it is hostile to climate mitigation. Here the focus was on four issues, namely the sources of right-wing populism that affect climate policy, why such populism in the US is hostile to mainstream climate policy, more specifically how this hostility was expressed in the Trump administration's policies, and the long-term implications for US climate mitigation. By way of conclusion, Fiorino (2022) asked if right wing populism is a passing phenomenon or a permanent fixture of US politics, and then argued that the answer to this question could determine the future of climate policy, not only in the US, but also in the world.

In their examination of how setting net zero targets can enable the formation of new publics and counter publics, Valenzuela and Lezaun (2024) explored how the expanding universe of net-zero pledges changes the field of climate politics by giving form to new forms of antagonism to net zero goals, and looked to illustrate their argument with reference to three specific examples, namely the UK's adoption of a legally binding commitment to net zero emissions by 2050. The authors suggested that opposition to net zero was not only expressed by a refusal to adopt a target, but also by resistance to disclose information that would make if possible to determine the practical meaning of specific pledges.

Frame of Reference and Method of Enquiry

Research, even exploratory research, into anti-net zero activities poses a number of challenges. On the one hand, the term anti-net zero receives, at best, limited attention in academic and policy discussions of the net-zero concept. This reflects a number of factors, including Manchester University Sustainable Consumption Institute's (2023) claim that *'opposition to climate action has been largely marginal for much of the period that climate change has been on the*

political agenda', and it also reflects the consistent and wholehearted support of many governments for net zero policies.

This paper looks to explore some of the themes that make up the narrative of anti-net zero, via a simple Internet survey, conducted on Google in August 2024 The search revealed the DeSmog Climate Disinformation Database (DeSmog 2024 a), which included over 800 organisations and individuals which have *'helped to delay and distract the public and our elected leaders from taking needed action to reduce greenhouse gas pollution and fight global warming'*, as a rich source of information about anti-net zero narratives. DeSmog (undated a) claims to be *'the world's number one source for accurate, fact-based information regarding global warming misinformation campaigns'*, and its Climate Disinformation Database which has an international spread and includes individuals and organisations, in 17 counties, provided a valuable source of information. for this paper.

More specifically, the author focussed on individuals and organisations listed in the database as being based in the UK and extracted three sources of information. Firstly, a simple exploratory review was undertaken of the positions on climate change adopted by a number of the organisations listed as being based in the UK. Secondly, a similar exercise was undertaken of the personal positions on climate change associated with a number of the individuals listed as being based in the UK. In both reviews the author was responsible for selecting the organisations and individuals, and this seemed justified in that the aim was to provide some of the nature and flavour of anti-net zero narratives. The information in the data base on both organisations and individuals was well structured and clearly signposted, and the author took the view that a detailed content analysis of the entry of each organisation and individual would be unnecessary in an exploratory study. Thirdly, an examination of the websites of two of the organisations in the database, namely the Global Watch Policy Foundation, Net Zero Watch allowed a focus on some of the specifics of anti-net zero narratives. More generally, as the database is in the public domain the author took the considered view that he was not required to seek formal-permission to draw information from it.

Anti-Net Zero Narratives

The anti-net zero material posted about each of the selected UK organisations and individuals on the DeSmog database embraces a wide range of interlinked themes, but rather than attempting a comprehensive coverage, or looking to provide details of each of the reported individual and organisational anti-net zero narratives, this paper looks to offer some of the nature and flavour of the opposition to net zero. Here, the information about UK organisations and individuals on the DeSmog database revealed a number of interlinked themes across a spectrum encompassing, accepting the reality of climate change coupled with concern about the pace set for the establishment of net zero targets, through questioning the data and the science of climate change, looking to highlight the differential effect of net zero policies across society, emphasising the benefits of carbon dioxide within the atmosphere, to claiming that climate change is not anthropogenic, but a natural phenomenon.

At the organisational level, the Net Zero Scrutiny Group, for example, was reported as accepting the fundamental facts of climate change and the need to reduce emissions, but also as arguing that government plans to achieve net zero emissions by 2050 were too rapid and too expensive. Net Zero Watch (undated a), argued *'it's sometimes claimed that we are in a climate emergency. The problem is that the data doesn't support this idea'*, while the DeSmog database reported Net Zero Watch arguing *'we don't dispute that climate changes, we dispute that we are on the verge of a climate catastrophe.'*

Net Zero Watch claimed that its goal was to highlight *'the serious implications of expensive and poorly considered climate change policies'* (Net Zero Watch undated a) and argued *'it's sometimes claimed that we are in a climate emergency. The problem is that the data doesn't support this idea'* (Net Zero Watch undated b), and claimed that it's goal was to highlight *'the serious implications of expensive and poorly considered climate change policies'* (Net Zero Watch undated b). Here Montford (2022), writing under the Net Zero Watch banner suggests that the move to net zero will cost £2,000 per household. The DeSmog data base reported that the Director General of the UK's Institute for Economic Affairs had argued driving towards net zero by 2050 was an overly costly target and that the UK government should abandon its net zero pursuits.

The European Climate Realist Network (2024), based in the UK, believes that

- *'That climate changes on all time scales*
- *That it is unknown what percentage of the warming in the past century is due to greenhouse gases*.
- *That there is no a priori reason to assume that the current and expected warming will have negative consequences*
- *That the Intergovernmental Panel on Climate Change overplays the role of greenhouse gases and underplays the role of other processes, like natural variability and solar or planetary influences.*
- *That climate models still have far too many shortcomings to use them as the major foundation for climate policy.*
- *That current climate policies will probably do more harm than good to society.*
- *That the climate debate has been far too politicized for a long time, and that a much more open scientific debate is badly needed.'*

Car 26 claims to campaign for rational analysis of climate matters, and is reported in the DeSmog database as being associated with the beliefs that climate change is not anthropogenic, and there are plenty of historical examples of climate change, and also questioning if carbon dioxide is a significant factor in global warming. The DeSmog database reported Spiked's claim that the climate emergency is the elites' response to the populist challenge. It represents the suspension of people's democratic aspirations.

The anti-net zero narratives of a large number of individuals are cited in the DeSmog database and, here again the aim is to provide a flavour of such narratives. John Stewart Agnew, a farmer and one-time Member of the European Parliament for the UK Independence Party, for example, is reported by the

DeSmog database as describing global warming as a scam, and blaming climatic change on cosmic ray fluctuations, sunspot activity and planetary gravitational pulls from elsewhere in the galaxy. Lee Anderson, a Reform UK Member of Parliament, is reported by the DeSmog database as claiming that net zero was nonsense, that if the UK became net zero tomorrow it wouldn't make any difference to the earth's atmosphere, because of the higher level of emissions produced by other countries, and that net zero is unfair on the poorest in society, because they are paying the price.

Jacob Rees-Mogg, former Conservative Member of Parliament and one time Secretary of State for Business, Energy and Industrial Strategy, is reported in the DeSmog database as arguing that the government had developed its net zero policies without thinking through the costs, that whatever approach the UK government adopted would not make any difference to global warming, and that the way forward was to allow technology to work out how to generate cleaner energy and then let the market decide. More generally, Jacob Rees-Mogg, was reported as suggesting that it was important to be realistic about what can be changed, and about the timescale over which such changes might be made, and arguing about the need to focus on changes in adaptability, rather than changes in behaviour.

John Redwood, a Conservative Member of Parliament from 1987-2024, was reported in the DeSmog database, as claiming that natural variability, and not man-made emissions, is to blame for the climate changing, and more specifically that the climate changes for all sorts of reasons, including volcanic activity, the jet stream, water vapour in the atmosphere, cloud formation and the sun's cycles as well as man-made carbon dioxide. Viscount Mathew Ridley, a Hereditary Peer in the House of Lords, was reported in the DeSmog database, arguing that global warming is good for society, in that it is creating a greener, safer planet, and that is, so far, mostly beneficial: and that *'this startling fact is kept from the public by a determined effort on the part of alarmists and their media allies who are determined to use the language of crisis and emergency'* (DeSmog undated b).

Some of the documents posted by Net Zero Watch and Global Watch Policy Foundation provided a focus on some of the specifics of anti-net zero narrative. In *'The War on the* Car', Ruppert (2023) writing under the Net Zero banner, suggested that while choosing a car was once a pleasurable experience, it's now as if *'the local and national rule makers don't want us to drive anymore'*, and that *'the interpretation has to be that Net Zero means absolute zero access to personal transportation'*, and that the point is *'keeping the plebs in their rightful place, namely the bus stop.'* More substantively Ruppert then proceeds to dismantle a number of the arguments about electric cars, the introduction of a car scrappage scheme in 2009, the introduction of ultra-low mission zone schemes, and road pricing, all arguably seen to facilitate a transition to net zero on the UK's roads.

In *'The Retreat from Net Zero'*, Clark (2024), also writing under the banner of Net Zero Watch, suggested that while politicians at the United Nations meetings on climate change had regularly emphasised the importance of decarbonising their economies, in reality they consistently put *'economic development well ahead of their promises to cut emissions.'* Clark (2024) also argued there was little evidence to suggest that many countries were joining the UK in setting demanding targets to

reduce greenhouse gas emissions, not least in that achieving such targets would *'involve the wholesale reinvention of agriculture, as well as industries such a steel, cement and fertilisers.'*

Pile (2021), in a paper published by The Global Watch Policy Foundation, argued that *'since the 2000s, the UK government and EU have set ambitious emissions-reduction targets, but they do not know how to achieve them without damaging the economy and causing a political backlash'*, and that claimed that there was *'no appetite for costly policies that require significant expense and draconian regulation of lifestyle.'* Pile (2021) concluded that the UK public's appetite for climate policies *'remains untested'*, and that *'further attempts to circumvent necessary democratic processes by convening glorified focus groups will merely prolong the crises that the UK's climate agenda is creating.'*

In addressing *'UK Food Strategy and Net Zero',* published by The Global Watch Policy Foundation, Livermore (2023) argued that *'the goal of Net Zero by 2050 for the UK is a highly demanding one that is almost certainly unachievable with current technology at a cost that consumers and voters would tolerate'*, and that *'far from giving a lead to the rest of the world, striving to achieve it would simply demonstrate the need to develop more cost-effective ways to generate and store energy on a vast scale without using fossil fuels.'* More specifically, Livermore (2023) claimed that *'imposing Net Zero targets on the farming sector would add a further degree of folly'*, and that *'Net Zero without some form of carbon capture would see the demise of farming in this country.'*

Concluding Discussion

This short exploratory paper reveals a number of the anti-net zero narratives within the public domain in the UK, and, as such, adds to the limited body of work that has been published in the academic business and management literature on anti-net zero thinking within the climate change debate. Many of the scenarios sketched out in the anti-net zero narratives, suggest that everyday life and the economy will be very different in a net zero future, and in truth, neither the UK government nor the major businesses who have emphasised their corporate commitment to the drive to net zero, have yet offered any pictures of what a net zero future might look like. That said, paradoxically, it may be similar to the future envisaged by those who are campaigning for a more sustainable future.

While a number of the themes in the anti-net zero narrative are contested by mainstream political and corporate voices, it is difficult to escape the overall conclusion that a continuing drive to net-zero will have a wholesale and wide-ranging impact in the business world. McKinsey and Company (2024), for example, identified six characteristics of the net-zero transition, namely that it is universal, significant, frontloaded, uneven, exposed to risk, and rich in opportunity. It is seen to be universal, for example, in that all the major land use and energy systems contribute to greenhouse gas emissions, and thus all will require massive change in order to move to a net zero future. More specifically, McKinsey and Company (2024) emphasised that all these systems are

interdependent, and thus 'reaching net zero emissions will thus require a universal transformation of the global economy.'

More positively, McKinsey and Company (2024) claimed that there could be considerable growth opportunities for countries and companies if they were able to access the growing markets in the transition to a net-zero economy. Here, opportunities were identified in decarbonising products and processes, and in the production of low-carbon products. Stern and Valero (2021), for example, looked to examine how policies and institutions might foster *'private sector investment in sustainable and productive assets at the scale and pace required to tackle climate change and simultaneously achieve a strong economic recovery and growth into the future.'* While the authors concluded that *'a robust carbon price be complemented by a suite of mutually reinforcing policies, regulations and investments in infrastructure, human capital and innovation'*, and that *'achieving large-scale change quickly will require an understanding of the opportunities and displacements in the next wave of technological change'*, they also recognised the importance of the *'demand side'*, and that *'changes in behaviours and preferences of consumers, workers, shareholders and voters are also key to driving change in business and policy decisions'* (Stern and Valero 2021).

For some commentators, technology certainly has an important role to play in driving the transition to net zero. The World Economic Forum (2023), for example, highlighted a number of technologies, including direct air capture and artificial intelligence, seen to be potential game changers in achieving net zero. For the World Economic Forum, the significance of direct air capture, for example, lies in its ability to address challenging emission sources such as long-distance transport and heavy industry and in its potential ability to address historical emissions. That said, the currently limited ability, and the cost, of direct air capture, are seen to be barriers to its widespread adoption. Artificial intelligence can facilitate the automation of a number of important tasks including energy management, energy demand and usage, and storage optimisation, but here again costs might be a major barrier to adoption.

The International Energy Agency argued that behavioural changes which affect the way people use energy were essential in the drive to reach net zero emissions by 2050. Here while the International Energy Agency (2021) emphasised the importance of deploying clean energy technologies and in harnessing technologies to improve energy efficiency, but also recognised that net zero emissions would not happen without *'the consent and support of people.'* Such behavioural changes are seen to include adjusting everyday behaviours that reduce wasteful or excessive energy consumption. Further, the International Energy Agency argued that such behavioural changes were particularly important in developed economies, where energy intensive lifestyles are the norm, and would involve cycling and walking instead of driving a motor vehicle, and turning down domestic heating. Some of the very activities on which the anti-net zero arguments and campaigns are based!

More generally, the World Economic Forum (2024) posed the question *'Is capitalism incompatible with effective climate change?'* In many ways, the tensions between the drive to net zero and the workings of the capitalist system are at the

heart of the challenge of net zero. Essentially capitalism is seen to prioritise economic growth over social and environmental concerns, and to lead to unsustainable consumption, the continuing use of fossil fuels and the destruction of nature. Gomes and Bohm (2023) investigated the threat of right-wing populism to rapid climate change and highlighted its role in undermining the global co-operation necessary for the *'deep transformation required within capitalism'* to achieve the drive to net zero.

This paper clearly has its limitations in that it essentially draws its empirical material exclusively from Internet sources, and that it relies on the author's selection from these sources. However, the author believes that this is a valid approach in what is an exploratory paper in a field where little work has been published to date, and that the paper might provide a platform for future research. Future research agendas, for example, might include, detailed empirical investigations not only of how anti-net zero organisations promote their messages to both large and small businesses, but also of consumers' attitudes to, and patronage of, companies that effectively adopt anti-net zero approaches. At the same time, theoretical work that looks to locate such arguments within more general debates about how businesses approach climate change also merit attention.

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Investing AI Ethics in Forensic Investigations: Development, Policies, and Best Practices

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Artificial intelligence (AI) is a dominant technological feature that affects the ethical use of forensic accountants during investigations. A code of ethics can help mitigate ethical risks such as those that arise when AI-generated digital information is presented as court evidence. Normative, informative, and advisory aspects underpin the formulation of a code of ethics and are examined. A conceptual framework, incorporating the research dimensions and philosophical perspectives, is tabled and then discussed to help navigate contemporary challenges such as those posed by AI. Forensic accountants must rely on ethical principles to guide their use of AI, since they are subject to the ethical standards set by their professional bodies. These philosophical principles, anchored in enduring moral principles that apply universally, guide ethical policy making and ensure effective ethical strategies for use in forensic investigations. Risks can be assessed with ethical policies and a code of ethics can be revised as new technologies become available. An effective code of ethics answers the questions whether, how, and to what extent the use of AI is ethically acceptable in forensic investigations. Lastly, introducing AI responsibly and ethically is also significant in teaching professional accountants about ethical principles and the risks associated with using AI.

Keywords: *accountant, artificial intelligence (AI), code of ethics, ethics, universal*

Introduction

Health care, law, education, transportation, energy, and the environment are all experiencing profound advances owing to artificial intelligence (AI). Advances are being made as data and computing power become more available and AI systems become more refined (Leslie 2019). AI technologies could play a crucial role in the advancement of public interest and human development as society progresses. In the field of forensics, artificial intelligence is used primarily as a tool for analysis, and forensic accountants use it primarily to identify possible accounting risks and oversee fraud prevention initiatives. The use of artificial intelligence in forensic investigations raises incidentally ethical questions. Although AI can perform tasks such as learning and mimicking human reasoning (Aldoseri et al. 2023); it lacks a unique moral code as it remains a machine. Since AI lacks conscience, new strategies must be developed to ensure that forensic

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accountants and governments use AI ethically in forensic investigations to avoid punishing innocent people (Jerian 2024).

When forensic accountants employ AI as a tool, the goal is analytical in nature. In forensic accounting, AI is used primarily to recognise potential accounting risks or manage fraud prevention activities. To ensure that forensic accountants or professional accountants adhere to ethical guidelines when using artificial intelligence software or programs, it is necessary to establish a code of conduct or a code of ethics (an ethics policy) that identifies international and domestic influences and inclinations. Ensuring consistent and regulated governance of AI is a significant and consequential challenge of our time, as rapid technological changes may pose high risks (UNESCO 2024). This need to implement consistent ethical norms and effective governance to minimise the potential dangers associated with AI is highlighted by the Global Forum on the Ethics of AI (2024). To determine the scope of the issue and weigh the potential risks and benefits, it is necessary first to determine what is at stake.

The philosopher Carissa Véliz, in her book *The Ethics of Privacy and Surveillance* (2023), discusses privacy regulations and how laws cannot predict good or bad behaviour because they change according to trends and the societies in which we live. Véliz (2023) argues that ethics must play a crucial role in shaping and changing the legislation that governs privacy and surveillance in the age of technology. She argues for the need for ethical considerations to ensure that legal frameworks are not only effective, but also represent the social values, behaviours, and customs of each individual (Véliz 2023). Ethics are an essential prerequisite for law, and regulations cannot exist without them. With the rise of data protection, surveillance, and AI challenges, ethics have to grow and improve the law to make it more effective and inclusive.

Véliz's (2023) ideas echo the UN's call to action for human rights, which reiterates the UN's commitments to civic space in a "time of socioeconomic-cultural crisis" (UN 2020), as well as the central priorities of the Organization for Economic Co-operation and Development (OECD), which urges members to protect and facilitate citizen participation while consolidating democracy (OECD 2022). The OECD (2022) also supports the idea of involving the public in decisions about AI policies and legal structures in a society that values freedom, democracy, openness, and a focus on the individual.

The Centre for Artificial Intelligence and Digital Policy (CAIDP 2024) has expressed concerns about the potential safety risks associated with uncontrolled advanced AI systems. These risks include generative AI, misinformation, deep fakes (videos that feature digitally altered faces), and voice cloning (CAIDP 2024). Therefore, it is important to understand the importance of ethical conduct that adheres to international standards for professional conduct of forensic accountants. Critical aspects include ethics, data privacy, and cybersecurity when using AI technologies. Several guiding pieces of South African legislation are noted at this stage, namely the Constitution of South Africa, 1996, the Cybercrimes Act 19 of 2020, the Electronic Communications and Transactions Act 25 of 2002 (ECTA), and the Protection of Personal Information Act 4 of 2023 (POPI Act). In this article, a discussion of the provisions in the Criminal Procedure Act 51 of 1977 and other

evidence rules is not necessary, but these should be discussed with the legal advisor on the forensic team.

Ensuring compliance with relevant international and domestic laws and regulations is necessary when developing a code of ethics, including normative, informative and advisory resources. For example, the Universal Guidelines for Artificial Intelligence (UGAI 2018, CAIDP 2023) which were introduced at the European Union's Global Privacy Assembly Conference in October 2018, represents a significant milestone in the incorporation of moral principles into the legal systems that govern technology. These guidelines underscore the importance of transparency, accountability, and human agency in the development and implementation of AI technologies. Their aim is to address the ethical issues raised by AI's impact on individual rights, drawing inspiration from a variety of sources, including human rights conventions, data protection laws, and ethical frameworks.

By outlining key principles like transparency, the right to human decision-making, obligations for identification, fairness, evaluation, and responsibility, accuracy, reliability, validity, public safety, cybersecurity, prohibition of covert profiling and singular scoring, and obligations for termination, the UGAI seek to provide guidance on the incorporation of ethical standards into both domestic and international policies. Prioritising social outcomes such as human wellbeing and ensuring sufficient oversight of AI systems by humans are critical factors to consider in law, regulations, and codes of ethics.

A conceptual framework follows that orients the research process.

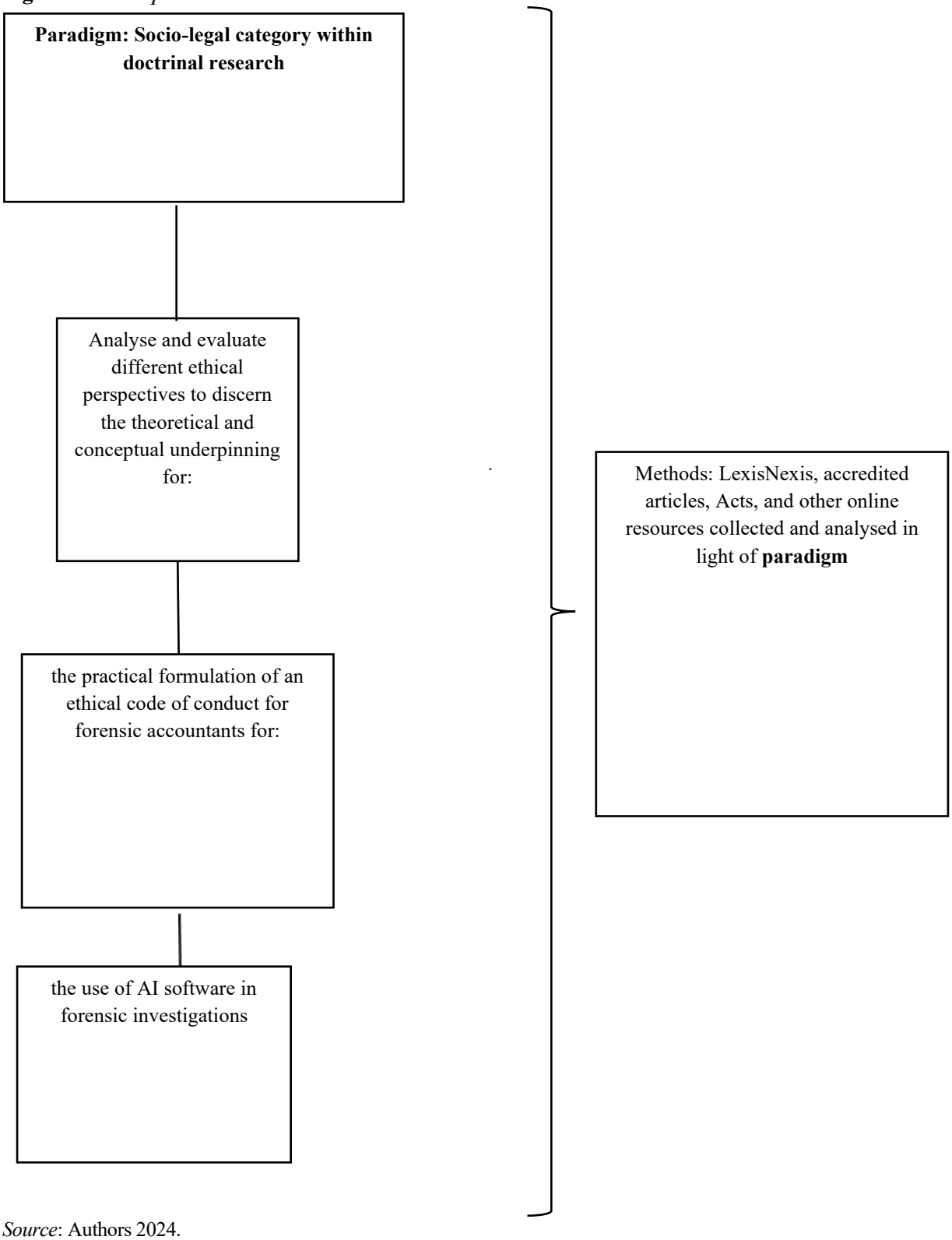
Conceptual Framework

In the first part of the article, background information and the context of the research were provided, along with a brief overview of the problem. A conceptual framework is herewith presented following Lester (2005) who indicates that such a configuration provides an orienting structure for the central concepts aligned to the research process along with the tabling of theoretical and substantive concepts.

In this study, primarily the socio-legal category, within doctrinal research (Arthurs 1983), is used to analyse and evaluate different ethical perspectives, and in doing so to identify key theoretical and conceptual underpinnings for the use of AI software in forensic investigations such that positive social outcomes are achieved.

The article therefore aims to establish, also from a practical perspective, the considerations that should be kept in mind when formulating an ethical policy or code of ethics that forensic accountants could use for AI applications during forensic investigations. This study uses methods that discerned and analysed electronic sources such as LexisNexis, accredited articles, Acts, and other online resources to conduct doctrinal research. These details are captured in the conceptual framework that follows:

Figure 1. *Conceptual Framework*



Source: Authors 2024.

Next, a review of the literature on ethical considerations applicable to a code of ethics is presented.

Objectives, Key Considerations, and a Review of Literature on the Use of AI in Forensic Investigations

One of the important considerations is transparency. Transparency is necessary to enable judgement (wisdom) of the ethical use of algorithms applied by AI. From a practical perspective, the objective is to encourage transparency in the use of AI algorithms and models in accounting processes. Although the South African Institute of Chartered Accountants (SAICA) Board has adopted a comprehensive Code of Professional Conduct, the use of AI in audits and risk assessments should be clearly defined and explained (SAICA 2021).

Another consideration is risk assessment, which describes the process of assessing risks associated with AI technologies, including poor data quality, biases and potential errors in AI-driven decision-making processes. A significant consideration when conducting a forensic investigation, as with any criminal investigation, is that people must be presumed innocent until any misconduct or crime is proven (see section 35 of the 1996 Constitution).

For SAICA members, the SAICA Code of Professional Conduct (subsection R607) allows chartered accountants to offer supportive litigation services to a public interest entity, provided that the firm of chartered accountants is not the appointed auditor of the same entity. For non-public entities, a chartered accountant may offer supportive litigation services, provided that the individual chartered accountant providing such services is not a member of the team that performs the audit on such entities (SAICA 2023: R607.5). However, should none of the threats to professional conduct (i.e. objectivity, advocacy, integrity, and professional behaviour be present), the SAICA professional code allows members to offer supportive litigation services, such as forensic accounting services, and to act as expert witnesses in court proceedings (SAICA 2023).

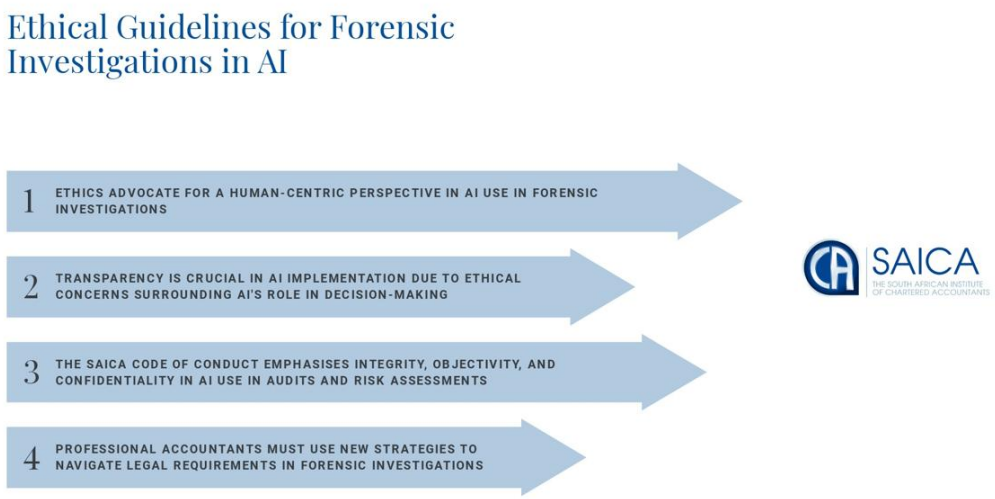
For members of the Independent Regulatory Board for Auditors (IRBA), IRBA describes the relationship of providing supportive litigation services to a client as an advocacy threat (IRBA 2023: 300.6 A1). Like SAICA, IRBA and the CPA (CPA, s120) also provide measures to address threats to professional conduct, such as assigning non-assurance services (e.g. litigation support relating to forensic accounting services) to a different partner than the one performing assurance services (IRBA 2023: 200.8 A2). Both the ICFP, which is the professional body for forensic accountants in South Africa, and the ACFE, which is the international body, require their members to act professionally by avoiding conflicts of interest (ICFP, Rules of conduct, 2.1; ACFE, Code of Professional Conduct, II).

These requirements to ensure independence are in agreement with the SAICA and IRBA codes of conduct, which confirm that they need to be included in policies on using AI in forensic investigations. Once it has been established that the ethical conduct of the forensic accountant will be acceptable to a court, the

details of the AI applied in the forensic investigation need to be addressed. The next section discusses philosophical aspects of ethics and AI.

In line with the SAICA Code of Professional Conduct, Figure 2 provides guidance on the use of ethical guidelines during a forensic investigation:

Figure 2. *AI Ethics in Forensic Investigations*



Source: Coltri 2024.

Ethics and AI

Aristotle (384–322 BCE) wrote *Nicomachean Ethics*, in which he addresses ethics, virtues, and human flourishing. Examining this work can help us understand how ethics function in the current digital era of AI. Aristotle believed that each action, decision, and investigation had a goal, and true fulfilment was achieved through the cultivation and excellence of virtue. This holistic approach to achieving a happy life is crucial for ethical considerations in the use of technology and AI. Aristotle also defined and applied technology (*techne*), which is the practical knowledge of doing or making things that are useful to humans and "defend humans" (Ellul 1964). The 20th century French philosopher Jacques Ellul (1912–1994), in his masterpiece *The Technological Society* (1954), argues that humans are not paying enough attention to the risks of technology. He believes that technology has the capacity to lead to catastrophe, and we need to be aware of its ethical consequences. This idea aligns with Aristotelian views, namely that technology, like the Natural Law, is determined by human reason and independent of the natural world. This distinction focuses on the unique role of humans in affecting their environment through invention and creativity.

Fulfilment and happiness are universal aspirations of all individuals, regardless of their background. AI, or pure machine action, can be considered a part of these universal aspirations to attain human excellence. Human excellence involves applying scientific frameworks to lead a morally virtuous life. AI goods can be considered good in and of themselves if they benefit from human action. If

AI developers benefit from their ideas or results, it can be concluded that AI contributes to an accountable, accurate, equitable, relevant and safe society, promoting human values and virtues.

Contemporary AI Ethicists

Contemporary AI ethicists, such as Friar Paolo Benanti, a member of the Italian AI Commission on Information and the UN Advisory Body on AI, argue that in the ethics of technology, technology is a human-created artefact (Benanti 2018), distinguishing between natural and artificial. Friar Benanti defends the use of AI in the context of human dignity. He argues that by examining our ethical principles, we can avoid the potential dangers of AI. Benanti's advocacy for AI that improves lives without jeopardising human dignity is evident in his interactions with influential figures in Silicon Valley. Consequently, a focus on AI ethics is crucial. It is important to delineate right and wrong, and to formulate codes and principals to guide ethical behaviour in the development and usage of AI technology.

Much has been written about the use of AI in theory and in the development of computer systems (Mikalef & Gupta 2021, Hunt 2014). In contrast, little has been written about the current state of AI in forensic investigations and the ethical considerations involved. To accomplish the objective of the study, which is to develop an ethics policy for forensic accounting, it is helpful to refer to the early works of Greek philosophers and ethicists for guidance. Ethics has been debated by several Greek philosophers, including Socrates, Plato, and Aristotle (Perdue 2014).

What is the highest goal that can be achieved through action or good practice? Everyone aspires to be fulfilled and happy, whether they are rich, poor, educated, healthy, or sick. Furthermore, if the goal of healthcare is health, the final goal of the economy is wealth, the end of military action is strategy or victory, and the end of education is knowledge, then all have an end; that is, fulfilment. Similarly, we analyse whether the act of deploying AI (a pure machine action that ought to be subjected to human capabilities and, therefore, regulated by ethical standards) is the end of human action, and hence human goodness.

Human excellence is defined as the ability to apply a scientific framework to answer key questions, and to lead a good and morally virtuous life. If we consider AI to be part of our universal good and excellence, we can divide goods into two categories: *a priori* and *posteriori*; the first is goods that we love and pursue for themselves and are intrinsic, and the second is goods by reason.

What kinds of AI goods would be considered good in and of themselves, and why? If AI goods are treated as entities that are separate from human action, they will almost certainly be worthless, and thus empty. As a result, the main argument is that if the AI developer will benefit from their idea or outcome, which is a good thing in and of itself, we can conclude that AI contributes to an accountable, accurate, equitable, relevant and safe society, and upholds human values and virtues. Somehow, this seems to be parallel with Aristotelian views.

In philosophy, according to the ancient Greeks, Plato and Aristotle, technology is similar to the natural law, which is determined by our human reason, and is therefore an outcome of human innovation and labour. This exists independently of

the natural world. This distinction emphasises the unique role of humans in affecting their environment through invention and, by extension, creativity.

AI Use and Moral Behaviour

Old debates about ethics are resurfacing as humans engage in technological change, interaction with AI, and moral behaviour (Bankins & Formosa 2023). For the professional accountant, this is significant, because the use of AI in forensic inquiries changes the moral code of use. The SAICA Code of Professional Conduct outlines several principles that establish the expected standard of conduct for professional accountants (SAICA 2022, p. 20). These principles include integrity, objectivity, professional competence, due care, confidentiality, and professional behaviour. The use of artificial intelligence in the field of forensic accounting raises ethical concerns about the extent to which AI should be involved in decision-making processes.

Forensic or professional accountants subscribe to codes of professional ethics (Naidoo 2021), and it cannot be delegated to AI as accountability for these codes cannot be transferred to algorithms, which lack moral agency (Raji et al. 2020). AI is based on a vast number of algorithms, and although the creators of these algorithms are held accountable by regulators (Novelli et al. 2023), such accountability cannot replace that of the professionals applying AI in their work (Munoko et al. 2020).

The questions now are how AI is employed during a forensic investigation and which ethical principles will affect the work of a professional accountant. By considering how these principles will affect their work, the professional accountant can adopt new strategies in the form of policies and procedures to assist with forensic inquiries. As a result, adopting the use of AI to conduct more effective forensic investigations is essential. Considering perpetrators' use of emerging technologies such as AI to commit financial crimes, it is necessary for professional accountants to adopt AI to conduct more efficient forensic investigations and catch up with perpetrators.

Additionally, it is important to ensure that the data used to create AI tools are reliable and free from bias. The question is how to do it. Professional accountants can use AI in their field of work by following the due process and using policy guidelines that address the principles stated above to improve their ethical behaviour in the workplace.

Conflict of Interest and Ethical Decision-making

Professional accountants' conflicts of interest arise from relationships with the entities on which they have a duty to report. Such relationships negatively affect the ability of the professional to report truthfully. Professional accountants are required to complete a declaration of interest form and present it to the designated manager before they conduct an investigation or audit. They are prohibited from participating in decisions that might affect organisations with whom they have a relationship. Professional accountants, when faced with an ethical dilemma, should answer the following questions:

- Are you carrying out your job responsibilities in a *bona fide* manner (in good faith)?
- Is your decision in line with the organisation's policies?
- Are you acting according to a specified procedure?
- Is the decision based on the core values of the organisation?
- Is the decision in line with your professional ethics and the law?

The decision or action aligns with the values of the organisation if the answer to all these questions is yes. It is important to treat cases of suspected fraud, theft or corruption with caution and, in terms of Chapter 7 of the Prevention and Combating of Corrupt Activities Act 12 of 2003, to report any fraudulent activities identified in an investigation.

Breach of Ethics and the Consequences of a Failure to Act Ethically

In the case of *S v Western Areas Ltd and Others* 2004 4 SA 91 (W), Labuschagne J addressed a comparable issue concerning an alleged fraud resulting from a failure to disclose information mandated by the rules of the Security Regulation Panel, the Companies Act, and the Johannesburg Stock Exchange (JSE) listing requirements:

> '[7] [7.1] … the crucial question for decision in this case is whether it is competent in law to found criminal liability for fraud based on a duty of disclosure flowing from the (SRP) rules and the Companies Act and the JSE listing requirements where neither the rules, the relevant provisions of the Companies Act nor the JSE listing requirements create criminal liability for their breach.'

Thus, a breach of the code of conduct by a professional accountant can also cause reputational damage and a loss of trust from clients, as well as legal consequences, including disciplinary action taken by their professional bodies and even being deregistered by their professional bodies. According to section 100.1A of the IRBA Code of Professional Conduct for Registered Auditors (2023), a code of conduct imposes obligations on the registered professional auditor. It also states that the accounting profession is distinguished by its commitment to act in the interest of the public and not only in the interest of the individual. Therefore, a registered auditor must comply with the code, unless prohibited to do so by other laws or regulations. Where laws and regulations do not prevail, the registered auditor shall comply with the other parts of the code.

Ethics and its Universal Influence

In his philosophical work *Groundwork of the Metaphysics of Morals* Immanuel Kant (1785) said, 'Act only according to that maxim, whereby you can at the same time will that it should become a universal law without contradiction.'

Kant's deontological ethical principle focuses on morality above other aims. It promotes universalism by encouraging organisations to behave as they would like others to behave. This technique may be related to AI laws. The ethical implications of AI and universal moral norms must be considered as they evolve. In the AI age, when robots may outperform humans, this is crucial.

Likewise, Copernicus's *De Revolutionibus* (1543) places the sun, rather than the earth, at the core of the cosmos, implying that the human subject is inevitably at the heart of the cognitive process. Before the revolution, people (subjects) had to adapt to nature (objects); today, with the roles reversed, nature must adapt to humans (Kuhn 1992). Such a Copernican revolution is part of the change in our values in an AI technological period, when our androcentric or human-centric perspective suggests that AI should be at the centre of the universe or cosmos, with AI serving as a mirror of human abilities and thus human knowledge. This shift in perspective encourages us to reconsider intelligence, awareness, and the implications of developing machines capable of outperforming humans.

In his most recent paper, Luciano Floridi (2024) comments about pronouncements on AI made by Pope Francis. Floridi (2024) argues that AI is not 'intelligence', but a technical tool that are without consciousness or emotions and can benefit people. AI is not neutral and always has an ethical value. It can be a tool for good or harm, depending on how it is used. As a result, humanity must ensure that it is used for good while avoiding misuse. The development and regulation of AI should not be solely based on rules and laws; AI development should be based on a spiritual approach, promoting social and environmental benefits and facilitating spiritual rebirth from the individual to the collective (Floridi 2024).

The Role of AI and Ethical Considerations in Organisational Commitment

Ethical policies or guidelines are contingent upon normative (legislation and primary case law), informative (organisational policies and procedures), and advisory resources that direct their implementation. These resources help organisations, especially employers in the field of accountancy, to establish ethical standards for decision-making and behaviour related to AI. In addition, they enable organisations to fulfil their social mandates by considering the consequences of their actions and AI-generated results on stakeholders and society. There is, however, a warning, as can be seen from the case of *Oudekraal Estates (Pty) Ltd v City of Cape Town and Others* 2004 (6) SA 222 (SCA). In this case, the Supreme Court of Appeal ruled that an unlawful act may still result in legally binding consequences, meaning that an unlawful decision remains enforceable until it is overturned. While we are navigating contemporary challenges, it is crucial to consider the philosophical perspectives of our ancestors, who strived to impart enduring moral principles that apply universally.

As we continue to develop AI, we have to examine its ethical and philosophical implications and also develop a set of categorical imperatives, or moral rules, that apply to everybody. In this new era of AI, it is crucial to consider the ethical implications of creating machines that may surpass human capabilities. It

is essential to establish universal moral guidelines to ensure that AI is developed and used responsibly.

Why do governments, companies, and people require rules, and how can rules be used to integrate AI systems? The EU created the AI Act in 2021. The Act came into effect on 13 March 2024 (European Commission 2024). This AI Act is an example of a vital regulatory framework that aims to regulate critical AI-related developments in organisations worldwide. These regulations aim to promote trustworthy AI in Europe and beyond by ensuring that AI systems uphold fundamental human rights, meet transparency and safety requirements, adhere to ethical standards, and address the risks associated with AI models.

The AI Act classifies AI systems into four risk categories: unacceptable, high-risk, low-risk, and general-purpose models. Data quality, openness, human supervision, accuracy, cybersecurity, and compliance play an important role in these systems.

Organisations have the deontological commitment to carry out impact assessments on rights, create risk management systems, notify people and test AI material under the AI Act. Violators face penalties amounting to 7% of their worldwide turnover, or 7.5 million euro in fines (European Parliament 2023) (Chee et al. 2023). The Centre for Artificial Intelligence and Digital Policy (CAIDP 2024) has expressed concerns about the potential safety risks associated with uncontrolled advanced AI systems. These risks include generative AI, misinformation, deep fakes (videos that feature digitally altered faces) and voice cloning (CAIDP 2024). Therefore, it is important to understand the importance of ethical conduct that adheres to international standards for the professional conduct of forensic accountants. The CAIDP has endorsed the Universal Guidelines for AI (UGAI) as a necessary tool when developing a code of ethics and regulations globally. For example, the introduction of the UGAI at the EU's Global Privacy Assembly Conference in October 2018 represents a significant milestone in incorporating moral principles into the legal systems that govern technology.

King IV Corporate Governance

For the purposes of King IV, proper corporate governance is defined as the exercise of ethical and effective leadership by the governing body towards the achievement of the following governance outcomes:

- Ethics culture
- Good performance
- Effective control
- Legitimacy

The use of 'corporate' in the term 'corporate governance' differentiates it from other forms of governance, for example national or political governance. 'Corporate' refers to legal entities separate from their founders and therefore applies to all forms of incorporation, whether as a company, voluntary association, retirement fund, trust, legislated entity, or others.

King IV defines ethics that resonates with Kant's definition. Consider what is good and right for you and the other, and what can be expressed in terms of the

golden rule. The golden rule is: Treat others as you would like to be treated yourself. In the context of organisations, ethics refer to ethical values applied to decision making, conduct, and the relationship between the organisation, its stakeholders, and society.

Ethical Behaviour and Business Practices

Integrity is essential for professional accountants to ensure ethical business practices. As they remain responsible for their actions and behaviours, integrity should permeate their business relationships. There are several constitutional principles and values that business practices may never violate, including respect for human dignity, non-discrimination, diversity, impartiality, and reputation. Whether it has previously been condoned or not, anything prohibited by organisational policy, law, or the Constitution remains prohibited.

AI Ethics and the Rights and Obligations of the Employer

It is the employer's responsibility to cultivate a culture of trust and respect for the dignity of the organisation among stakeholders. All stakeholders' needs must be treated as equally important. Fairness, impartiality, and justice are all aspects of ethical behaviour. A code of ethics not only pertains to the conduct of employees in financial matters, but also requires transparency and integration with other employer policies. Forensic accountants must apply their skills, competencies, and expertise when using AI in investigations to act ethically by upholding the values of the organisation. Organisations must be transparent about their AI ethics policies and practices to build trust with stakeholders. Accountability mechanisms must be in place to ensure that ethical guidelines are followed, and that any violations are addressed effectively and from a human-centric perspective (Lepri et al. 2021).

Integrating AI in Forensic Accounting

As stated above, ethics teaches us that AI should be used from a more human-centric perspective; thus, in the case of a forensic investigation, we advocate an ethical policy for forensic accountants when using AI in investigations. The South African Institute of Chartered Accountants (SAICA) Code of Professional Conduct provides for audits and risk assessments. Risk assessment involves evaluating data quality, biases, and potential errors. Permission to investigate is presumed until misconduct or a crime has been proved.

The use of *artificial intelligence* in forensic accounting raises ethical concerns, as it changes the moral code of conduct. The SAICA Code of Professional Conduct outlines principles such as integrity, objectivity, professional competence, due care, confidentiality, and professional behaviour (SAICA 2022). Since AI lacks moral agency (Raji et al. 2020), accountants cannot delegate professional ethics (Naidoo 2021). Governments are responsible for holding AI systems accountable (Novelli et

al. 2023), but they cannot replace the professionals who use AI in their work (Munoko et al. 2020).

The following questions arise: How is AI used during a forensic investigation? Which ethical principles will affect the work of the professional accountant? By considering these principles, professional accountants can adopt new strategies in the form of policies and procedures to assist with forensic investigations. Given that criminals use AI tools to commit financial crimes, adopting AI ethics to perform more effective and reliable forensic investigations is necessary to ensure successful convictions.

Forensic accountants must maintain professional affiliations and uphold codes of conduct as AI continues to evolve. For example, members of professional bodies for forensic accountants in South Africa must avoid conflicts of interest when providing services. Possible conflicts of interest are defined by the Institute of Commercial Forensic Practitioners (CFP) and the Association of Certified Fraud Examiners (ACFE).

Forensic accountants employ AI to detect fraud and submit results to court (Kommunuri 2022), and provide the defendant with the source code of these algorithms (Garrett 2020). By employing AI ethically, they should be able to defend its benefits of increased accuracy and context (Novelli et al. 2023). Auditors must remain responsible for the results generated by AI technologies, using professional scepticism to ensure dependability (Ghanoum & Alaba 2020) and avoiding shifting responsibility for audit errors (Malouin 2020). Data governance principles should form the basis of rules for data collected, stored, managed and processed by AI, making sure that data protection laws (e.g. the Cybercrimes Act 19 of 2020 in South Africa and the Economic Crime and Corporate Transparency Act 2023 in the United Kingdom) are followed. Despite the ethical implications, the Cybercrimes Act 19 of 2020 does not explicitly prohibit AI from collecting personal information.

One of the measures used by auditors to assess the quality of their work is the frequency of restating already audited amounts. The use of AI has been found to reduce such restatements significantly, which proves that AI brings about increased accuracy (Fedyk et al. 2022). In the final analysis, the auditor remains responsible for the results produced by AI tools by exercising professional scepticism to ensure that the results are reliable (Ghanoum & Alaba 2020). Such accountability also holds for forensic accountants as the results presented will be scrutinised by the court.

Evidence and AI

Courts must be informed of the exact procedures followed and the steps taken to obtain and preserve the evidence presented to them (chain of custody). The respondent (defendant) in a court case is entitled to an explanation of how AI was applied to arrive at the evidence presented. Such explanations should be sufficient to stand up or be subjected to public scrutiny (Collenette et al. 2023). Documenting the use of AI systems can help to facilitate accountability by

creating a clear audit trail. AI evidence can only be presented to court if it is accompanied by the necessary documentation, there is a complete audit trail and the chain of custody has been maintained.

Chain of custody should be proven from the point where permission has been obtained in the form of a court order, up to the point where evidence has been submitted. The forensic accountant must explain every step taken to process the data, up to the conclusion drawn, to the court, and may be challenged by the counsel for the respondents (defence). The forensic accountant's explanation will include which AI applications were applied and why the forensic accountant decided to apply them. Furthermore, the court needs to be informed of the AI data analysis results and the evidence emerging from those results to prove or disprove allegations.

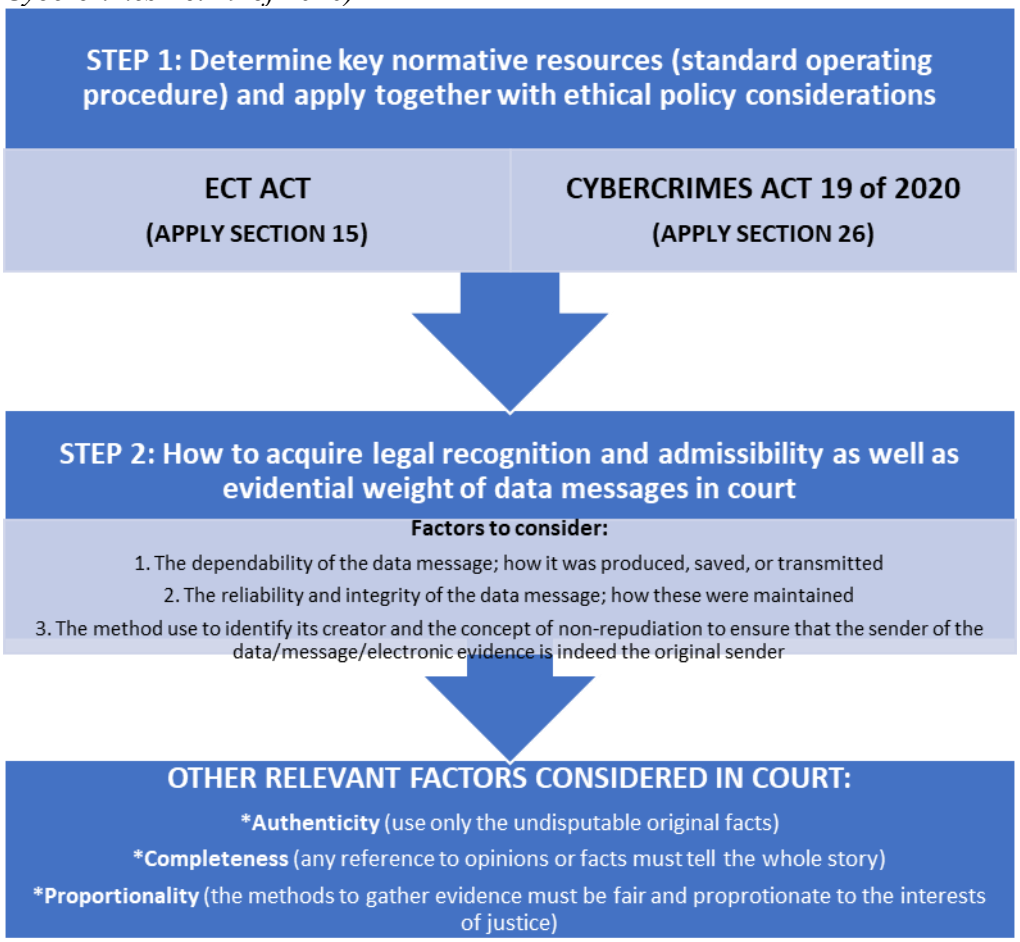
Requirements for the chain of custody and the transparency of AI usage should be incorporated in the code of ethics. Note that the requirement for data governance aligns with the chain-of-custody specifications discussed in the previous paragraph. Such governance principles should establish guidelines on data acquisition, storage, and management, guaranteeing compliance with data protection laws, including the ECTA and the Cybercrimes Act. It is crucial to consider concerns about data privacy and the application of sensitive data in light of the POPI Act 4 of 2023.

The code of ethics must be supported by training and competency objectives that promote ongoing professional development to ensure that accountants develop the necessary skills and knowledge to work effectively with AI technologies. It is essential to encourage them to learn about AI and the role of ethics in its responsible use, as well as to mitigate emotional bias and irresponsible AI practices through employer training initiatives. Coping with emotional bias in the ever-changing world of technology is crucial and should be supported by the code of ethics. To ensure collaboration with AI, accountants should be encouraged to accept AI as a tool to enhance rather than replace their own inputs.

Monitoring and evaluation are critical, therefore it is imperative to establish procedures to assess the performance and impact of AI technologies on accounting processes regularly. The precision, reliability, and fairness of all technologies used must be evaluated regularly. Forensic accountants will need to ensure that the AI software used has been fully reviewed and originates from a reliable source. Software designed specifically for forensic accountants should be accompanied by comprehensive explanations that may be provided in court. If an AI produces incorrect findings, the service provider could be exposed to negligence cases (Bambauer 2023).

However, the professional codes of SAICA and similar bodies will continue to require their members to accept final responsibility for the accuracy of their work and will not hold service providers vicariously or strictly liable, although a degree of blame will be shared between the professional and the AI service provider (Bambauer 2023). Figure 3 can serve as a standard operating procedure (SOP) for use during a forensic investigation, together with an ethics policy and the POPI Act 4 of 2023.

Figure 3. *Adopted SOP for Use by Forensic Accountants to Verify the Admissibility and Evidential Weight of Cyber Evidence (adaptation from section 26 of the Cybercrimes Act 19 of 2020)*



Source: Authors 2024.

Code of Conduct and Ethics Standards for Accounting Professionals

Professional accountants and officials must maintain high ethical standards when using *artificial intelligence* during forensic investigations. This they must do in order to achieve positive social outcomes. They must also disclose any conflicts of interest that may arise, as stipulated by the National Treasury Regulations published in GN R225 of the Government Gazette 27388 on March 15, 2005 (reg 16A.8). A code of ethics must be read in the context of the general legislative framework and other mandatory and regulatory prescripts. For example, the National Treasury Code of Conduct for Supply Chain Management Practitioners (National Treasury 2003) requires that high ethical standards of conduct must be met by all officials and persons doing business with the government. As the credibility of supply chain management practices has been questioned by various media commentators, the importance of ethical behaviour cannot be overstated.

Development of the Code of Ethics

The first part of the code should consist of an explanation of normative, informative, and advisory sources, including definitions. The second part presents the policy, its scope, and ethical behaviour and conduct in the workplace, and its application in business practices. The third and final section of the code could include the rights and obligations of employers and professional accountants, their relationships with stakeholders, the handling of conflicts of interest, relationships with third parties, and ethical decision-making. As past trends suggest a promising future trajectory (Papanikos 2024), it would be deemed prudent to review the code regularly.

Normative, Informative, and Advisory Resources

Every code of ethics should include normative and informative sources. Advisory sources provide additional guidance on best practices and are only persuasive in nature. This is necessary to provide a living framework document to adopt the key principles and values that underlie the code. For example, the UK government adopted an outcomes-based framework to regulate AI based on key principles and values, including safety, security, transparency, explainability, fairness, accountability, governance, contestability, and redress (Deloitte 2024). Such an outcomes-based code is a pertinent reminder of the responsibilities that its theoretical and substantive concepts should offer to society. Hence, within this study, the socio-legal paradigm (see Section: Conceptual Framework) provides the meta-level worldview that informs the practical formulation of the code of ethics. In the light of social outcomes, we posit the resource-bases below that guide the code.

Firstly, a code of ethics should be guided by the regulatory landscape within which it operates (normative resources). From a South African perspective, a key normative resource is the Constitution of South Africa, 1996. It supports human values, including the right to privacy (section 9), the right to the security of people (section 12), and the right not to be automatically assumed guilty (section 35). Normative resources include the Prevention and Combating of Corrupt Activities Act 12 of 2004, Protected Disclosures Act 26 of 2000, Public Finance Management Act 1 of 1999 (as amended), and, as previously mentioned, the POPI Act 4 of 2023, the Cybercrimes Act 19 of 2020, and the ECTA.

Secondly, the use of informative resources could include current or existing organisational policies and procedures.

Thirdly, advisory references can be obtained from experts in the fields of ethics and AI, such as forensic auditors and IT specialists. These advisors can train AI software to perform compliance checks on a client's system to determine whether a prescribed standard has been applied correctly (Ng & Alarcon 2020). Other references could include academic or scientific papers or written material that provides background information or introduces alternative views on AI that are both ethical (Vyas 2022) and technically sound (Danish 2023).

A discussion of the significance of definitions is an essential next step in the draughting of ethics. Examples of definitions can be found in various statutes and regulations. Definitions should generally be included in the first paragraphs of a

code. Definitions serve as statements that provide the meaning of a word or phrase. They also provide guidance to the policy user regarding the factual meaning of a word or phrase, regardless of how it may be interpreted in a particular context. Since different values may be assigned to a word or phrase, providing a clear and accurate definition clarifies and explains the actual purpose and intent of that word or phrase to the user. For example, AI can have a dual purpose (think of its military/peace and risk detection/risk prevention abilities). Definitions are necessary to eliminate ambiguity and confusion. To ensure that a policy is comprehensive and widely accepted, it is crucial to consult with relevant stakeholders when defining words or phrases. It is advisable to provide stakeholders with multiple interpretations, such as those found in dictionaries or online.

Any code should provide for the enhancement of gender sensitivity. Non-discriminatory wording must not only be used with reference to gender, but also for other sensitive identifiers such as race, religion, privacy, age, disability, and equity. AI can inherit human flaws during the design phase, and therefore the sensitive issues mentioned above should be carefully considered when big data are analysed.

The second part of the code includes the introduction, scope, and ethical principles that should be incorporated. This section includes information resources such as other organisational policies. In accordance with the scope of the code, all stakeholders should be recognised. Ethics should describe ways to behave in specific business situations based on the concepts of right and wrong. Ethical behaviour involves the ability to discern what is morally right and to commit to taking the appropriate course of action.

To ensure continuous improvement of the code, it is necessary to encourage feedback and active participation from professionals, such as forensic accountants, to improve the details and ensure the code remains abreast of evolving technology and industry standards. Improvements are required to keep AI ethics useful by guarding against meaningless, isolated, and toothless principles. AI justice should be practised by engaging with groups that may suffer as a result of AI usage, such as LGBTQIA+ communities and migrants. AI justice should also aim to decolonise AI by refraining from using discriminatory terminology.

Conclusions

This article aimed to establish, from a practical perspective, the ethical considerations for an ethical policy or ethics code for use by professional accountants when using AI. The philosophical debates presented in this paper show that a holistic approach is necessary to achieve a meaningful code of ethics by which professional accountants can do their work. For the sake of human values, AI must create an accountable, accurate, equitable, relevant, and safe environment. Integrating AI into forensic accounting practices is not only necessary, but it has also become a requirement to meet the demands of the changing world. AI must be trained to recognise potential biases and account for them when making decisions. Additionally, AI algorithms must be tested and monitored for accuracy, fairness, and accountability. Finally, AI systems should be

regularly reviewed and updated to ensure their continued ethical use, as the past is an indicator of the future.

Gathering evidence using AI technology requires that the evidence chain be maintained by professional accountants. To validate evidence, a complete audit trail and an explanation of every step are required by the court. Organisations and employees must be guided by normative, informative, and advisory resources when pursuing ethical considerations when using AI. This means that when AI is used to conduct investigations and gather accounting evidence, it is crucial to keep an eye on the legislative requirements (laws and regulations) and on the guiding policies of the organisation. In a follow-up article, practical examples of ethical policies will be examined and evaluated to develop a code of ethics.

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A Legal Case Study as a Testing Ground for AI's Role in Aligning NPM Theory and Practice in Italian Healthcare

By Salvatore Cincimino[*]

This paper critically examines the enduring chasm between New Public Management (NPM) theory and its practical failure within the Italian healthcare system, using a detailed legal case study as a stark illustration. Despite the formal adoption of NPM principles through Italian Legislative Decree no. 502/1992, systemic bureaucratic resistance and deeply entrenched practices are demonstrably shown to have not merely hindered, but effectively nullified their implementation. The case study reveals a profound and systemic bureaucratic inertia that consistently overrides NPM reforms at every level, leading to persistent inefficiencies and significant resource depletion. In light of this fundamental failure of conventional control mechanisms and theoretical frameworks, this study explores the disruptive potential of Artificial Intelligence (AI), particularly recent advancements in reasoning-oriented Large Language Models (LLMs). AI is not presented as a mere advisory tool or another incremental reform, but as a potentially inescapable and structural element for transforming decision-making processes. While initial tests with LLMs indicate their capacity to offer timely and reasoned guidance, the core argument advances beyond simple implementation of NPM principles. The analysis ultimately posits that AI's true disruptive power lies in its ability to become an indispensable component of the administrative system itself, fundamentally altering the landscape of public administration and healthcare by overcoming previously insurmountable barriers between theory and practice in ways that conventional approaches have consistently failed to achieve.

Keywords: *artificial intelligence, large language model, reasoning AI, bureaucracy, new public management, legal case, Italian healthcare system*

Introduction

The persistent failure to translate New Public Management (NPM) theory into effective practice within the Italian healthcare system exposes a fundamental and deeply rooted systemic breakdown between policy design and practical implementation. While the core principles of NPM—efficiency, accountability, and evidence-based decision-making—have been nominally embraced and formally codified through Legislative Decree no. 502/1992 (Decreto Legislativo n. 502/1992), their real-world application consistently collides with entrenched bureaucratic resistance and a pervasive systemic inertia. This paper meticulously examines this profound disconnect through the lens of a landmark legal case study, offering a uniquely

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evidence-based and sobering perspective that moves far beyond mere theoretical speculation about the potential of Artificial Intelligence (AI).

Without the concrete grounding of this case study, discussions surrounding AI's capacity to overcome bureaucratic inertia and finally align public administration with NPM principles would indeed risk being dismissed as purely academic and disconnected from reality. Critics might naively suggest that the tasks envisioned for AI, such as ensuring guideline adherence, fostering innovation, and enabling data-driven decisions, are already achievable by any diligent and competent administrator. However, the exhaustive legal proceedings detailed in this paper definitively demonstrate the fallacy of this assumption. Even the most determined and protracted efforts to implement NPM principles were systematically and relentlessly obstructed. Across an almost 20-year span, every attempt to prevent the stifling of innovation and to uphold NPM guidelines was ultimately and decisively defeated by entrenched bureaucratic resistance. The judicially validated findings paint a stark picture of how deeply embedded practices and institutional inertia not only impede progress but actively inflict irreparable damage, leaving no realistic prospect of remediation even after nearly two decades of struggle.

his context positions AI not as a convenient theoretical add-on, but as a necessary disruptive force in the face of demonstrable systemic collapse. This paper utilizes the case study as a rigorous testing ground to explore the truly disruptive potential of AI, specifically reasoning-oriented Large Language Models (LLMs), as a transformative and potentially indispensable structural component within public administration. Where traditional control mechanisms - internal audits, judicial oversight, and media scrutiny - have demonstrably and repeatedly failed, AI offers a radical departure: the possibility of embedding economic, legal, and strategic intelligence directly into the administrative fabric, creating a system that inherently combines innovation with adherence to established principles. By rigorously analyzing AI's potential to dismantle barriers proven insurmountable by all conventional approaches, this paper argues that AI is not merely a helpful tool, but a critical and perhaps inevitable catalyst for bridging the seemingly unbridgeable chasm between NPM theory and administrative practice, forging a path forward where all other methods have faltered and failed.

The paper is organized into 10 sections to comprehensively address the multifaceted aspects of the study. Following this Introduction, Section 2 reviews the theoretical background and key principles of NPM; Section 3 details the research methodology, including the data sources and analytical approach; Section 4 presents the chronology of events in the case study; Section 5 reports the results derived from the analysis; Section 6 offers an in-depth discussion of these findings; Section 7 describes the experiments conducted with AI and examines their implications; Section 8 provides a concise Questions and Answers section that distills the core insights; Section 9 critically examines the limitations and critiques of the present study; and finally, Section 10 concludes the paper, summarizing the contributions and suggesting directions for future research.

New Public Management: Theoretical Background and Key Principles

New Public Management (NPM) has fundamentally transformed public administration since its emergence in the 1980s, introducing private sector principles and practices into public service delivery. As Hood (1991) first articulated, NPM represents a paradigmatic shift characterized by performance measurement, market mechanisms, and organizational restructuring. The theoretical foundation of NPM draws from new institutional economics and neo-scientific management studies, providing a framework for understanding public sector reform initiatives (Hood 1991, Pollitt and Bouckaert 2017).

Research by Hyndman and Lapsley (2016) demonstrates NPM's remarkable resilience and adaptability, describing it as having "virus-like" characteristics that enable its continued influence across different political administrations and economic contexts. These findings align with Rovik's (2011) virus theory, which explains how management ideas can become deeply embedded in organizational structures while adapting to changing circumstances.

The translation of NPM principles has been particularly evident in the UK, where successive governments have repackaged and reinforced its core tenets under different labels, such as "modernisation" under New Labour (Hyndman and Lapsley 2016).

Dunleavy et al. (2005) argue that NPM has been superseded by Digital Era Governance (DEG), suggesting that information technology and digitalization now drive public sector reform (Osborne 2006). However, Hyndman and Lapsley (2016) demonstrate that NPM principles persist and intensify, particularly during periods of financial constraint. Hood and Dixon's (2016) analysis reveal that cost-cutting initiatives and performance-based reforms have become more prevalent in response to fiscal pressures.

Contemporary evidence indicates that NPM's influence extends beyond its original formulation, incorporating new elements while maintaining its core focus on efficiency, performance measurement, and market-oriented mechanisms (Pollitt 2016).

The synthesis of private sector management techniques with public service delivery continues to shape reform agendas, though with growing recognition of implementation challenges and unintended consequences (Hood and Dixon 2016). The framework's implementation varies significantly across contexts, reflecting local political, social, and administrative conditions (Hyndman and Lapsley 2016).

Materials and Methods

This section discusses the methodology used to analyze a significant legal case involving the implementation of NPM principles within the Italian healthcare system. This case has not yet concluded but has reached a fundamental milestone with a landmark ruling (Cassazione Civile 2024) from the CdC - Corte di Cassazione, i.e. Italian Supreme Court (Chiarloni 2014), which established general legal principles influencing the interpretation and application of administrative law within public sector operations.

The case involves a long legal battle between a healthcare consultant, referred to as FB, and the local Italian Local Health Authority (ASL). FB is a physician with expertise in AI and Information Technologies (IT) and has been an Adjunct Associate Professor at an American School of Medicine since 1989. Within the ASL, he worked as a freelance medical consultant (Beccaria 2024).

The dispute arose from the abrupt and unexplained termination of FB's consultancy contract, despite his successful development of software solutions aimed at enhancing operational efficiencies within the ASL through innovative applications of AI and IT.

The author of this paper has direct knowledge of the case, having been involved as an expert appointed by FB. To ensure maximum objectivity and reliability, the analysis is based exclusively on court-ordered expert reports and the final ruling of the CdC. This methodological choice excludes any information from party-appointed expert reports, including those involving the author. The focus on judicially certified evidence provides a robust foundation for the analysis and leverages the unique aspects of this case study. The twenty-year legal proceedings, culminating in a Supreme Court decision, offer a comprehensive and thoroughly scrutinized body of evidence. This approach aligns with best practices in case study research where the researcher has insider knowledge (Unluer 2012), while also adhering to Yin's (2018) principles of using multiple sources of evidence to ensure construct validity in case study research. The methodological approach employed in this study integrates key theoretical frameworks from recent literature on qualitative research methods, as Berger's (2015) recommendations on researcher reflexivity and Merriam and Tisdell's (2016) guidance on the importance of data triangulation as a crucial mechanism for ensuring research validity and reliability through the convergence of multiple data sources and perspectives.

The approach follows Eisenhardt and Graebner's (2007) guidelines on theory building from case studies, particularly relevant when the researcher has a privileged insider perspective which offers unique insights into organizational dynamics while requiring careful methodological consideration to balance insider knowledge with analytical rigor.

Chronology of Events in the Case Study

1. *2004-2007 - The Consultancy*: FB was hired by the ASL to develop two software programs: one for the analysis of corporate information, the other for managing outpatient clinics.
2. *2005, December - The Indicators*: FB submitted a report summarizing the first 2 years of consultancy. This report included the results of each procedure developed, showcasing improvements in service quality and potential economies and rationalizations. It detailed the rationale of the procedures, highlighting the strategic and operational benefits, and provided synthetic indicators that offered a concise overview of the effectiveness and efficiency of the implemented solutions.
3. *2007 - End of the Consultancy*: The collaboration was abruptly terminated without any justification.

4. *2007 - Start of the Legal Action*: Negotiations between FB's lawyers, the ASL management, and the independent auditing body of the ASL (Collegio Sindacale - CS) failed, leading to legal action.
5. *2008, May - First Court-Ordered Expert Report*: The first technical consultancy ordered by the judge was delivered, confirming the validity of FB's consultancy and the functionality of the software. Despite this, the ASL continued the legal process. As a result, FB terminated all work relationships with the local ASL and other Italian ASLs, dedicating himself full-time to his activities in the USA (Beccaria 2024). However, driven by a desire for justice and in solidarity with others who, lacking alternative employment opportunities abroad, had been forced to acquiesce, FB decided to continue the legal action. (Beccaria 2024).
6. *2008, July to November – The media*: The media outlets reported a story about erroneous payments from the State to the ASL and from the ASL to family physicians. The ASL and its legal office claimed to know nothing and portrayed themselves as victims, despite being aware of the issue since 2005, as it was one of the many results of FB's software. Moreover, these results were validated by the judicial expert in the presence of the ASL legal team in 2007 and documented in the court-ordered consultancy in May 2008.
7. *2012, January - Second Court-Ordered Expert Report*: This 41-page report confirmed the correct functioning of all features in the software produced by FB. It meticulously calculated the value of the functions actually used by the ASL and those that the ASL had available but chose not to utilize. Notably, among the latter, the report identified one particular unused function that could have saved the ASL €5,620,176.00.
8. *2014 - First-Degree Sentence*: The first-degree court accepted FB's claim and ordered the ASL to pay €435,000.
9. *2016 - Second-Degree Sentence*: The second-degree court rejected FB's claim, denying any compensation.
10. *2024, March - Third-Degree Sentence*: The CdC recognized FB's right to be compensated for the work performed, establishing a fundamental legal principle for similar future cases (Cassazione Civile 2024; Beccaria 2024).
11. *2025, March - Next hearing* for a new quantification of the compensation as ordered by the CdC.

Results

The Case Study and the NPM

New Public Management was formally integrated into the Italian healthcare system through Legislative Decree no. 502/1992 (Decreto Legislativo n. 502/1992). This decree emphasized the use of performance metrics, synthetic indicators, and comparative cost analyses to enhance efficiency and effectiveness in public healthcare administration. This case study is particularly relevant to NPM

because FB's software prominently featured indicators and metrics central to NPM principles (event 2).

The case study reveals a stark contrast between NPM theory and practice. Initially, the ASL requested, widely appreciated, and utilized FB's work. However, despite the demonstrated effectiveness through court-validated metrics and its alignment with legal requirements, the ASL management abruptly changed its orientation, ceased using the software, disregarded the positive performance metrics, engaged in a protracted eighteen-year legal battle, and exhibited strong resistance to innovation and data-driven decision-making.

This discrepancy between NPM's theoretical framework and its practical implementation in the Italian public healthcare sector underscores the challenges of overcoming institutional inertia, despite clear evidence of potential improvements (or perhaps because of those potential improvements). The case study thus provides a concrete example of how a theoretically sound management approach, supported by legislative mandate, can fail to achieve its intended outcomes due to entrenched resistance within public administration.

The chronology of events in the case study highlights the gap between NPM theory and practice in the Italian healthcare system:

- *Duration*: The legal case's eighteen-year span (events 4-11) starkly contradicts NPM's emphasis on efficiency and timely decision-making. While NPM advocates for streamlined processes, this prolonged legal battle demonstrates the opposite in practice.
- *Resistance to innovation*: The ASL's abrupt termination of FB's contract in 2007 (event 3), despite proven efficiency gains, shows a stark contrast to NPM's promotion of innovation and continuous improvement. This resistance indicates a deeply rooted bureaucratic culture opposing NPM's change-oriented approach (Ferlie and Ongaro 2015).
- *Missed opportunities*: The ASL's failure to implement FB's software, which could have prevented financial losses (as seen in the 2008 media case), contradicts NPM's emphasis on cost-effectiveness and performance measurement, showcasing a disconnect between NPM's focus on outcomes and ASL's practices.
- *Legal complexities*: The multiple court levels and expert consultations involved (events 4, 5, 7-11) reflect an administrative system far from the lean, efficient model proposed by NPM.
- *Media involvement*: The cases reported in the media (event 6) highlight a lack of transparency and accountability in practice, as the ASL failed to disclose known issues and their potential solutions, contradicting NPM principles.
- *Institutional inertia*: The ASL's continued legal pursuit for seventeen years after the first court-ordered technical consultancy strongly contradicts NPM's principles of flexibility and adaptability. This rigid stance, despite evidence supporting FB's claims, shows a failure to embrace NPM's emphasis on evidence-based decision-making and organizational learning.

- *Broader implications*: This case study vividly illustrates the gap between NPM theory and practice in Italian healthcare. It shows how deeply ingrained bureaucratic practices can resist and undermine attempts to implement NPM principles, even when these principles are formally adopted through legislation, as evidenced by the entire chronology of events.

These observations underscore the significant challenges in translating NPM theory into practice within the Italian healthcare system, revealing a pervasive resistance to change that extends beyond a single institution and persists over an extended period.

The Failure of All Control Systems

The case study reveals a widespread failure of multiple control mechanisms within the Italian public sector, while also showcasing the eventual, albeit delayed, effectiveness of the judicial system:

- *Internal Controls*: The ASL's internal auditing body (CS) and legal office, both of which are required to provide independent opinions relative to ASL management, failed to address the issues raised by FB's work (event 4), allowing mismanagement to continue unchecked.
- *Judicial System*: Despite its extreme tardiness, the judicial system ultimately delivered justice. The process, spanning seventeen years, concluded with a landmark ruling by the Cassation in 2024 that established important legal principles for future cases. However, the process is not yet fully concluded (event 11). While the delay significantly reduced the impact of FB's innovations and definitively compromised his collaboration, the final judgment demonstrates the system's capacity to correct long-standing wrongs.
- *Media*: Despite reporting on the media in 2008 (event 6), the media failed to uncover the connection to FB's case or the ongoing legal proceedings, missing an opportunity for public accountability.

Wealth Creation vs. Wealth Destruction

This case study provides a stark contrast between potential wealth creation and actual wealth destruction within the Italian public healthcare system.

<u>Wealth Creation</u>

- *Direct Benefits*: FB's work led to *immediate efficiency gains and cost savings*, as validated by the court-appointed technical consultant (event 5). These improvements represented tangible value creation for the ASL.
- *Quantifiable Savings*: The second Party-Appointed Expert Report in 2012 provided concrete evidence of potential savings, calculating that a single function of FB's software could have saved the ASL €5,620,176.00 (in 2005 values).

- *Indirect Benefits*: The exposure of ASL staff to advanced data analysis and AI technologies (as evidenced by FB's work in America) could have fostered long-term skill development and innovation capacity within the organization.
- *Potential for Scalability*: The software and methodologies developed by FB had the potential for implementation across other regional and national administrations, potentially multiplying the benefits (implied throughout the case).
- *Potential Improvement in Healthcare Quality*: While not directly quantified in the case study, FB's innovations had the potential to significantly improve the quality of patient care. By enhancing operational efficiency and data analysis capabilities, healthcare providers could potentially make more informed decisions, reduce waiting times, and allocate resources more effectively, all contributing to better patient outcomes. A prime example from the case study is the automatic application of Wolff's six criteria for clinical risk calculation (Wolff 1996) on 673,330 hospital discharge records, as reported in FB's 2005 summary (event 2). This application, along with numerous other indicators presented in the 2005 report, demonstrates the system's potential to significantly enhance clinical risk management and overall healthcare quality.

Wealth Destruction

- *Termination of NPM System*: The abrupt end to FB's consultancy led to the cessation of the NPM-aligned system he had implemented, *which was not replaced by any equivalent system* (as confirmed by the court expert).
- *Direct Financial Losses*: Millions of euros in preventable losses were incurred, as evidenced by the media in 2008 (event 6), and quantified by the 2012 expert report (event 7).
- *Legal Costs*: The prolonged seventeen-year legal battle resulted in substantial costs for both FB and the public administration.
- *Opportunity Costs*: Other regional and national administrations were deprived of the opportunity to benefit from FB's innovative technologies, potentially multiplying the €5.6 million loss across the healthcare system.
- *Brain Drain*: FB's complete disengagement from the Italian healthcare administration and subsequent focus on his U.S. activities exemplify the broader issue of brain drain (event 5).
- *Deterrent Effect*: The treatment of FB's case sends a discouraging message to potential innovators, likely deterring creative contributions to public administration or encouraging further emigration of skilled professionals.
- *Missed Opportunities* for Healthcare Quality Improvement: The rejection of FB's innovations likely resulted in missed opportunities to enhance the quality of patient care. While not directly quantified in the legal proceedings, these losses in potential health outcomes represent a significant, albeit intangible, form of wealth destruction.
- *Potential Increase in Medical Errors*: The failure to implement advanced data analysis and AI technologies may have resulted in a higher rate of

medical errors or missed diagnoses that could have been prevented with more sophisticated decision support systems.

- *Long-term Public Health Impacts*: The inability to leverage advanced data analytics for population health management and preventive care strategies may have resulted in poorer long-term health outcomes for the population served by the ASL, representing a substantial, though unquantified, societal cost.
- *Loss of Trust in Healthcare System*: The public revelation of inefficiencies and resistance to innovation (as evidenced by the legal battle) could lead to a loss of public trust in the healthcare system, potentially resulting in delayed care-seeking behaviors and worse health outcomes.

This analysis underscores the significant net loss resulting from the ASL's actions. Not only was potential wealth creation stifled, with concrete evidence of over €5.6 million in lost savings from just one function, but substantial resources were also wasted in defending an ultimately untenable position. The case serves as a cautionary tale of how resistance to innovation and mismanagement can lead to both direct financial losses and broader, long-term negative impacts on public sector efficiency and human capital retention.

Note on Causes and Responsibilities in the Case Study - It is important to note that throughout the legal proceedings, neither the magistrates nor the court-appointed expert investigated the underlying causes or assigned responsibility for the events described in this case study. Their focus was solely on verifying the quality and quantity of FB's work and determining his right to appropriate compensation. Consequently, as this paper is based exclusively on data validated through judicial investigation, no speculation on the specific causes of the reported events will be made. The analysis and conclusions are limited to general considerations applicable to the broader economic, social, and political context in which these events occurred. This approach ensures that the findings remain grounded in judicially verified facts while allowing for a broader discussion of systemic issues in public administration and healthcare management.

Discussion

The failure of NPM to fully deliver on its promises has been widely documented in academic literature (Hood and Peters 2004, Diefenbach 2009, Lapsley 2009). Scholars have identified various causes for this shortfall, including cultural resistance to change (Pollitt and Bouckaert 2017), misalignment with public sector values (Behn 1998), and the complexity of public sector goals. Some argue that NPM's market-oriented approach is fundamentally incompatible with the nature of public services (Denhardt and Denhardt 2000), while others point to implementation failures and the persistence of bureaucratic inertia (Dunleavy et al. 2006). However, much of this research relies on theoretical analysis or limited empirical studies. In contrast, our case study offers a unique, judicially validated perspective on NPM failure. Unlike previous studies, the findings in this case are

substantiated by an extensive twenty-year legal process, culminating in a definitive ruling by the Cads.

Systemic resistance to NPM - This judicial validation offers concrete, legally verified evidence of systemic resistance to change, failure of control mechanisms, and the gap between NPM theory and practice in the Italian healthcare system, offering a robust foundation for understanding the practical obstacles to NPM implementation.

Failure of control mechanisms - The failure of control mechanisms - including internal audits, media scrutiny, and specialized oversight agencies - underscores a massive problem that cannot be resolved merely through additional regulations or control bodies. The depth and breadth of this systemic ineffectiveness, coupled with the extremely delayed (though ultimately correct) judicial resolution, call for a disruptive approach. This approach must fundamentally alter how public administration operates and is monitored, ensuring that innovations and efficiency measures are not just theoretically adopted but practically implemented and sustained in a timely manner.

Countermeasures and Automated Feedback Systems - Given the ineffectiveness of current control systems, the focus of this paper is on potential countermeasures rather than the personal, economic, bureaucratic, or political causes of systemic failure. Strengthening current mechanisms or adding more oversight would likely face the same issues and increase bureaucracy and costs. Instead, it is proposed to explore systems with 'automatic' feedback that are non-circumventable and binding. These systems should operate independently of human intervention, using technologies such as AI and blockchain to ensure transparency, accountability, and efficiency (Wirtz et al. 2019). By implementing these automated systems, a self-regulating environment can be created that overcomes resistance to change and innovation. This approach aligns NPM principles with their practical implementation, fostering a more responsive and efficient public administration system.

Automatic feedback mechanisms are not uncommon in the private sector. A typical example is when a CEO commits to achieving specific objectives within a set timeframe, with financial rewards contingent upon meeting these goals. A notable instance of this involved Elon Musk, whose compensation was directly tied to Tesla's market performance and operational milestones (Jin et al. 2024).

In the public sector, Italy, particularly Sicily, has introduced a comparable mechanism through Regional Law No. 5 of 14-04-2009, Article 20, paragraph 4 of this law states*: 'Failure to achieve economic balance in relation to the resources negotiated in compliance with the set objectives ... results in the automatic dismissal of the general director of the Regional Health Service Companies.'* (Legge Regione Sicilia 14 aprile 2009 no. 5). This mechanism has been triggered several times, although it has faced challenges from affected parties, citing reasons such as the limited freedom of action of a public manager compared to a private one.

These examples demonstrate the potential for implementing binding, automatic feedback systems in both private and public sectors. However, the challenges faced in Sicily highlight the need for careful design of such systems in the public sector, taking into account the unique constraints and complexities of

public administration, even if the ASLs are called 'Regional Health Service Companies' in the law (Anessi-Pessina and Cantù 2006).

In the context of our case study, it's important to note that the Sicilian law, while innovative, would not have had any significant effect. This is because it is linked only to a general budget objective and not to a detailed series of specific efficiency targets. For FB's innovations to have been properly implemented and evaluated, a more granular approach would have been necessary.

The Need for Innovative, Irreversible Control Systems - A control system that is much less easily circumvented than the one described in the previous paragraph, and far more granular than one based on overall budget results, already exists and is in daily use in banks: the credit scoring system. This system provides a comprehensive, data-driven approach to evaluating performance and risk, offering a potential model for public sector innovations (Thomas et al. 2017).

Credit scoring systems have evolved from optional support tools to comprehensive, data-driven systems that leverage vast amounts of information and employ advanced statistical techniques and AI. This evolution has transformed their role from advisory to effectively mandatory. The result is that any bank officer wishing to "override" the system's assessment could be held personally accountable. This represents a significant qualitative leap enabled by information technology and particularly AI compared to previous systems. The key distinction is that this intervention is granular and specific, rather than generic, and is practically unavoidable. This is not due to legislative mandate (which we have seen can be regularly circumvented) but rather due to the undeniable advantages in terms of results and processing times that cannot be relinquished. The system's effectiveness stems from its ability to provide rapid, data-driven decisions that demonstrably improve outcomes, making any attempt to bypass it not only risky but also counterproductive in terms of efficiency and accuracy.

Why AI - AI is not mentioned here merely as an advanced form of IT, nor due to the currently widespread belief that it's a panacea for every problem. Instead, it's highlighted for specific, crucial reasons:

- *Irreversibility*: AI is the engine powering the credit scoring systems described earlier, which have achieved a level of 'irreversibility' that can overcome bureaucratic resistance. This irreversibility is critical in contexts where entrenched opposition might otherwise prevail against innovative solutions.
- *Complex Decision-Making*: LLMs and their forthcoming evolutions can provide insights on situations even more complex than credit scoring. For instance, they can evaluate the most cost-effective software tools or assess proposals from collaborators formally outside the bureaucratic structure, offering unconventional yet valuable perspectives.
- *Principled Adaptability*: Current AI technologies, particularly modern LLMs, are the only type of software capable of doing something that until recently was exclusively human: applying general principles, such as those of NPM, to a specific and novel operational context, and doing so effectively, comprehensibly, and consistently. This ability to adapt general principles to specific, unfamiliar situations represents a potentially revolutionary advancement.

No 'algorithmic' software to date has exhibited these three properties simultaneously. AI can do this, and it's already demonstrating this capability effectively. This unique combination of irreversibility, complex decision-making support, and principled adaptability makes AI particularly suited to address the challenges identified in our case study, potentially bridging the gap between NPM theory and practice in ways previously unattainable (Moon 2023, Straub et al. 2023).

AI in Public Administration - As observed in the previous paragraphs, AI possesses the characteristics of granularity (micro-management) and efficiency that make its adoption inevitable, much like what occurred in the banking sector. In the context of our case study, we can hypothesize the following effects:

- *Healthcare Management*: AI-driven decision support systems could have provided real-time analysis of FB's consultancy and software solutions, demonstrating their value instantaneously. This could have prevented the abrupt termination of FB's collaboration, ensuring continued support for innovative solutions and potentially avoiding the loss of efficiency gains.
- *Auditing and Compliance*: Advanced AI could continuously monitor and analyze financial transactions and operational efficiency, conducting real-time audits and compliance checks. This might have prevented the media case reported in events 6, and fundamentally changed or even eliminated the role of traditional auditing bodies like the CS mentioned in event 4 (CNDCEC 2021).
- *Legal Analysis*: AI-powered legal tools could have processed legal documents, identified relevant precedents, and provided strategic advice. This could have led to an early settlement after the first court-ordered technical consultancy (event 5), potentially avoiding the seventeen-year legal battle described in events 4-11.
- *Judicial Proceedings*: AI could assist judges and lawyers by rapidly analyzing case documents and predicting outcomes. This could have significantly sped up the judicial process, potentially avoiding the need for multiple court levels and expert consultations.
- *Investigative Journalism*: AI could analyze vast amounts of data to uncover connections and patterns, enabling more accurate and comprehensive reporting on irregularities. This could have linked the media case reported in event 6 to the ongoing legal case, providing a more complete picture to the public and relevant authorities.

AI's potential in public administration goes far beyond a mere list of innovative functions. This paper, through its extensively validated case study, demonstrates a crucial point: even the best systems, perfectly aligned with public administration needs and theoretical and legislative frameworks, can be systematically sabotaged and replaced with nothing comparable for years, despite the activation of multiple independent control bodies and ongoing legal action.

The true significance of AI in this context lies in its potential as a disruptive innovation, in Tony Seba's sense - offering such a qualitative and/or economic leap that its adoption becomes inevitable (Dorr and Seba 2021, Fleischer and Wanckel

2024). Much like the transformation of credit scoring in the banking sector, AI in public administration has the potential to create systems that are not just innovative, but inescapable due to their efficiency and effectiveness.

This inevitability is key. It's not about the spectacular features AI might offer, but about its capacity to fundamentally alter decision-making processes in a way that cannot be circumvented. AI's integration into areas traditionally considered the exclusive domain of humans - from routine administration to complex judicial proceedings - represents a paradigm shift. This shift promises to make the kind of systemic failures observed in our case study not just unlikely, but virtually impossible.

This paradigm shift is not merely desirable; it is increasingly necessary. Without such disruptive interventions, the costs of the public healthcare system would continue to escalate to unsustainable levels, as evidenced by the wealth destruction outlined earlier in this study. Simultaneously, the quality of service would inevitably suffer. The systematic suppression of innovative contributions from the most creative individuals, as demonstrated in our case study, leads to their demotivation or even exodus to other institutions, often abroad. This brain drain represents not just a loss of talent, but a compounding factor in the decline of service quality and operational efficiency (D'Ignoti 2021).

AI's potential as a disruptive force, therefore, extends beyond mere operational improvements. It presents an opportunity to fundamentally restructure incentives and decision-making processes in a way that nurtures innovation, retains talent, and creates a self-correcting system resistant to the kind of bureaucratic inertia observed in our study. By making efficiency and effectiveness inescapable features of the system, AI could help reverse the trend of escalating costs and declining quality, creating a more sustainable and responsive public healthcare system.

The advent of AI thus heralds not just an improvement, but a transformation of public administration and healthcare. It offers the potential to create self-regulating, transparent, and accountable systems that are resistant to the kind of entrenched bureaucratic resistance documented in this study. This transformation represents one of the essential contributions this paper aims to highlight: the need for and potential of truly disruptive innovations in overcoming the persistent gap between administrative theory and practice (Mikhaylov et al. 2018).

The First AI Experiment

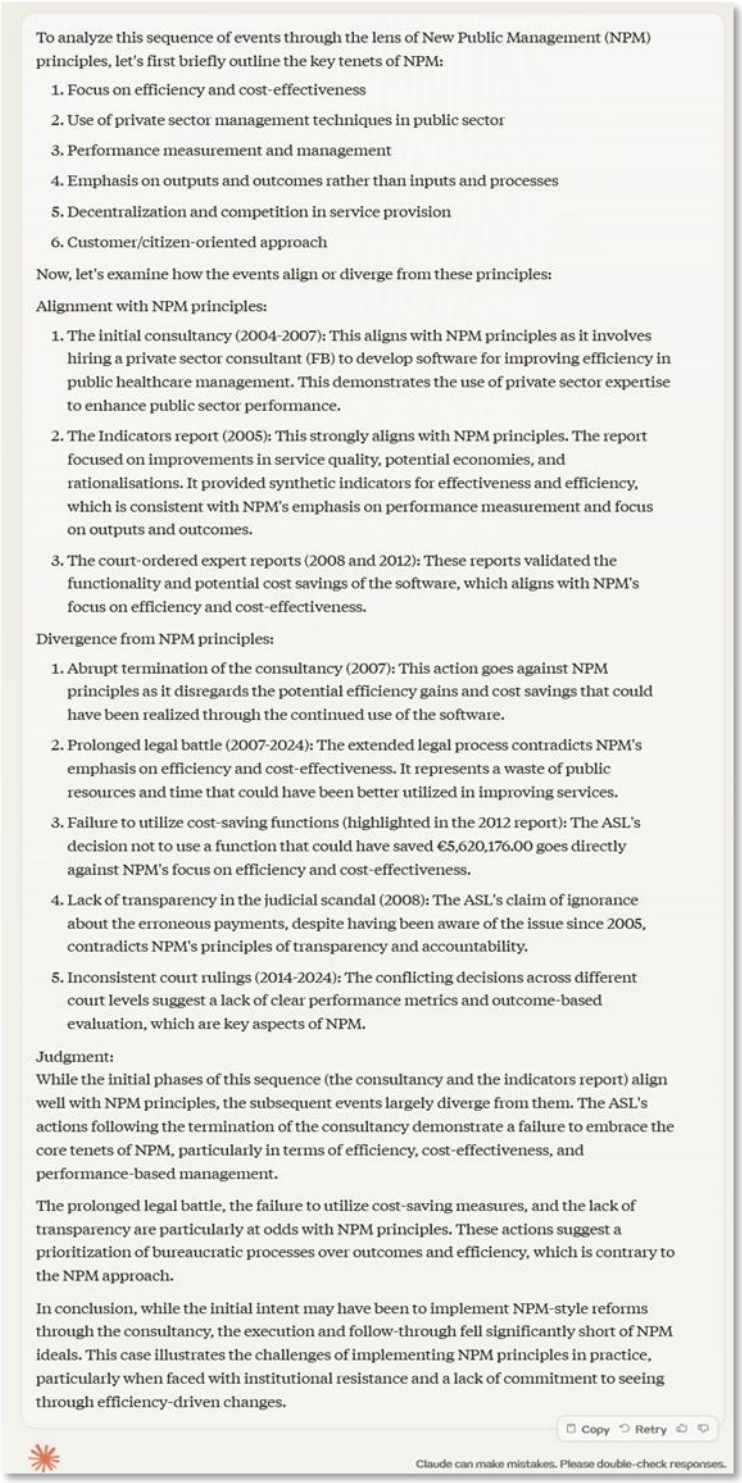
While this paper is firmly grounded in factual data, even certified by judicial authority, the conclusion that AI can effectively apply NPM concepts to specific contexts remains an intriguing, yet theoretical proposition. To provide a glimpse into the potential future role of AI as hypothesized in this paper, an experiment was conducted. The question depicted in Figure 1 was posed to one of the most advanced large language models currently available: Claude 3.5 Sonnet by Anthropic (https://www.anthropic.com). Figure 2 display the screenshot of its response.

This is, of course, just an experiment. The Large Language Model was not pre-trained or specialized in any way, and the question was asked in a new chat without any prior interaction. Nevertheless, the Claude ability to grasp the problem

and provide coherent observations is striking. It offers a taste of the future, but one that is very nearby!

Figure 1. *Screenshot of the Question to Claude 3.5 Sonnet (July 2024 Version) (The Question is: 'Analyze the following sequence of events and apply the principles of New Public Management (NPM) to determine whether these events align with NPM principles. Provide a detailed explanation for your judgment.' Followed by the Chronology of events in the Case Study as in Materials and Methods in this paper)*

Figure 2. *Screenshot of the Answer by Claude 3.5 Sonnet to the Question Posed in Figure 1 (It's notable how the LLM delves into specifics, first enunciating the NPM principles it will apply, and then evaluating the alignment or divergence from these principles in the various events of the chronology. The analysis is comprehensive and pertinent, demonstrating the LLM's ability to apply theoretical concepts to specific scenarios)*



To analyze this sequence of events through the lens of New Public Management (NPM) principles, let's first briefly outline the key tenets of NPM:

1. Focus on efficiency and cost-effectiveness
2. Use of private sector management techniques in public sector
3. Performance measurement and management
4. Emphasis on outputs and outcomes rather than inputs and processes
5. Decentralization and competition in service provision
6. Customer/citizen-oriented approach

Now, let's examine how the events align or diverge from these principles:

Alignment with NPM principles:

1. The initial consultancy (2004-2007): This aligns with NPM principles as it involves hiring a private sector consultant (FB) to develop software for improving efficiency in public healthcare management. This demonstrates the use of private sector expertise to enhance public sector performance.
2. The Indicators report (2005): This strongly aligns with NPM principles. The report focused on improvements in service quality, potential economies, and rationalisations. It provided synthetic indicators for effectiveness and efficiency, which is consistent with NPM's emphasis on performance measurement and focus on outputs and outcomes.
3. The court-ordered expert reports (2008 and 2012): These reports validated the functionality and potential cost savings of the software, which aligns with NPM's focus on efficiency and cost-effectiveness.

Divergence from NPM principles:

1. Abrupt termination of the consultancy (2007): This action goes against NPM principles as it disregards the potential efficiency gains and cost savings that could have been realized through the continued use of the software.
2. Prolonged legal battle (2007-2024): The extended legal process contradicts NPM's emphasis on efficiency and cost-effectiveness. It represents a waste of public resources and time that could have been better utilized in improving services.
3. Failure to utilize cost-saving functions (highlighted in the 2012 report): The ASL's decision not to use a function that could have saved €5,620,176.00 goes directly against NPM's focus on efficiency and cost-effectiveness.
4. Lack of transparency in the judicial scandal (2008): The ASL's claim of ignorance about the erroneous payments, despite having been aware of the issue since 2005, contradicts NPM's principles of transparency and accountability.
5. Inconsistent court rulings (2014-2024): The conflicting decisions across different court levels suggest a lack of clear performance metrics and outcome-based evaluation, which are key aspects of NPM.

Judgment:
While the initial phases of this sequence (the consultancy and the indicators report) align well with NPM principles, the subsequent events largely diverge from them. The ASL's actions following the termination of the consultancy demonstrate a failure to embrace the core tenets of NPM, particularly in terms of efficiency, cost-effectiveness, and performance-based management.

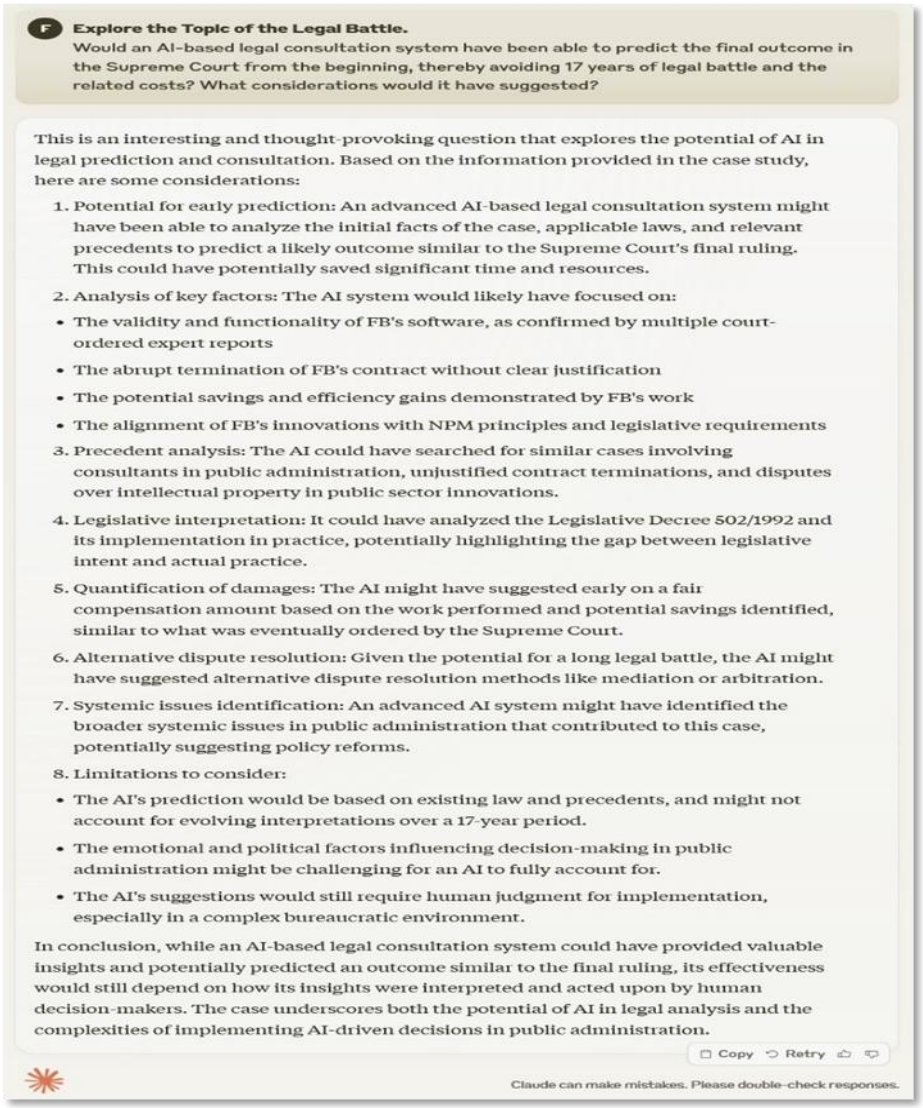
The prolonged legal battle, the failure to utilize cost-saving measures, and the lack of transparency are particularly at odds with NPM principles. These actions suggest a prioritization of bureaucratic processes over outcomes and efficiency, which is contrary to the NPM approach.

In conclusion, while the initial intent may have been to implement NPM-style reforms through the consultancy, the execution and follow-through fell significantly short of NPM ideals. This case illustrates the challenges of implementing NPM principles in practice, particularly when faced with institutional resistance and a lack of commitment to seeing through efficiency-driven changes.

Copy Retry

Claude can make mistakes. Please double-check responses.

Figure 3. *Screenshot of a Specific Question Posed to Claude 3.5 Sonnet about an AI System's Ability to Predict, from the Outset, the Outcome that would be Reached 17 Years Later (The LLM delves into specifics, demonstrating how it would have cited a series of arguments to advise the legal office and management. It goes further by exploring potential political, bureaucratic, and personal reactions to AI-generated suggestions. This response showcases the LLM's capacity to provide comprehensive legal and strategic advice, as well as its ability to anticipate human factors in decision-making processes)*

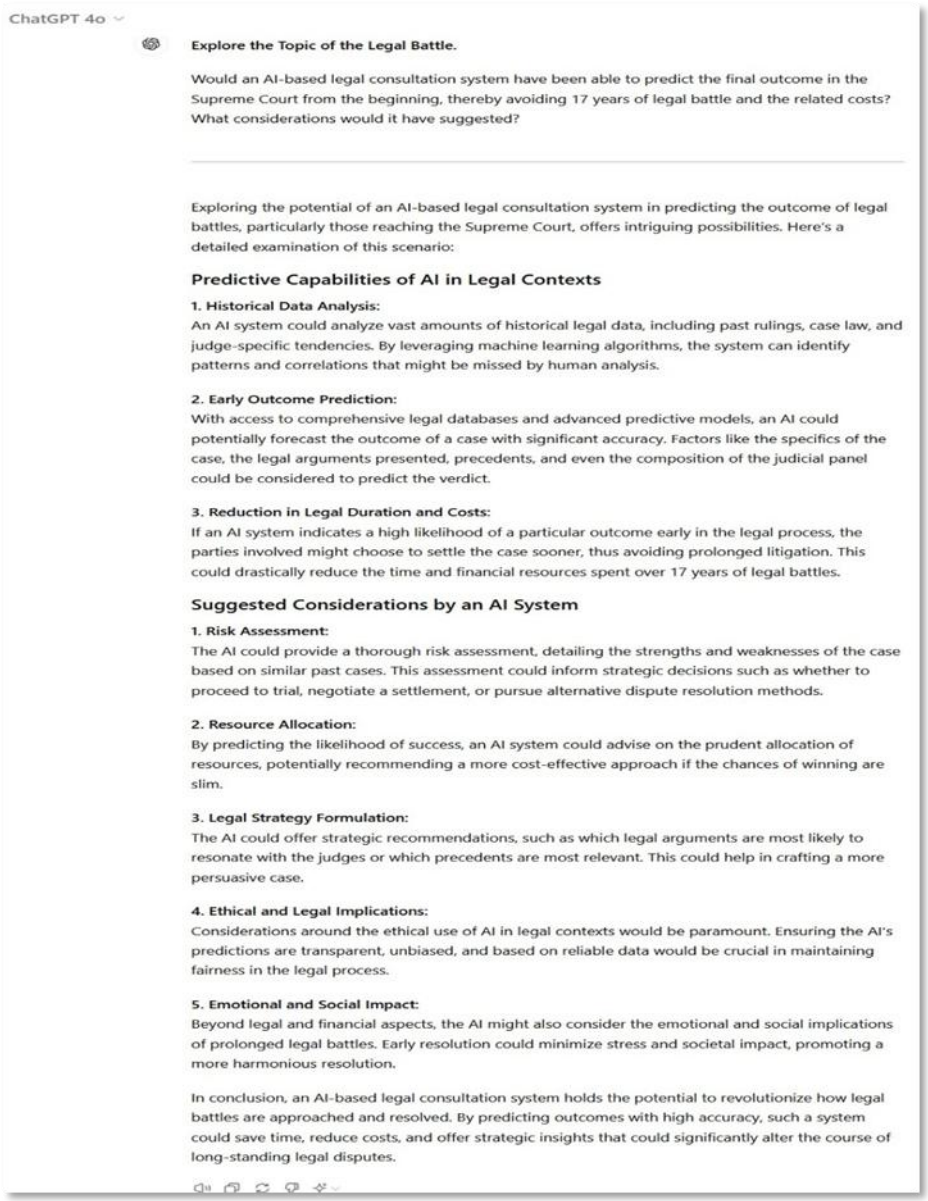


This expanded caption highlights the LLM's analytical approach and its capacity to apply NPM principles to the case study events, emphasizing the thoroughness and relevance of its analysis.

In Figures 3 and 4, an attempt was made to explore whether LLMs could have effectively advised the legal office and management of the ASL regarding the prolonged legal battle. This experiment was conducted using Claude 3.5 Sonnet and ChatGPT-4 Omni by OpenAI (https://openai.com/chatgpt/). The aim was to assess

how these advanced AI systems might approach complex legal and administrative scenarios, potentially offering insights that could have altered the course of the lengthy dispute.

Figure 4. *Screenshot of the Same Question in Figure 3 Posed this Time to Another LLM, ChatGPT4o (A significantly different approach from the other LLM is evident, demonstrating the diversity and competition in this sector. Particularly noteworthy is the final consideration on the effect of an AI-based consultation system that can accurately predict the likely outcomes of legal action. This response not only showcases the unique analytical approach of ChatGPT4o but also highlights the potential transformative impact of AI systems in legal strategy and decision-making processes)*


ChatGPT 4o

Explore the Topic of the Legal Battle.

Would an AI-based legal consultation system have been able to predict the final outcome in the Supreme Court from the beginning, thereby avoiding 17 years of legal battle and the related costs? What considerations would it have suggested?

Exploring the potential of an AI-based legal consultation system in predicting the outcome of legal battles, particularly those reaching the Supreme Court, offers intriguing possibilities. Here's a detailed examination of this scenario:

Predictive Capabilities of AI in Legal Contexts

1. Historical Data Analysis:
An AI system could analyze vast amounts of historical legal data, including past rulings, case law, and judge-specific tendencies. By leveraging machine learning algorithms, the system can identify patterns and correlations that might be missed by human analysis.

2. Early Outcome Prediction:
With access to comprehensive legal databases and advanced predictive models, an AI could potentially forecast the outcome of a case with significant accuracy. Factors like the specifics of the case, the legal arguments presented, precedents, and even the composition of the judicial panel could be considered to predict the verdict.

3. Reduction in Legal Duration and Costs:
If an AI system indicates a high likelihood of a particular outcome early in the legal process, the parties involved might choose to settle the case sooner, thus avoiding prolonged litigation. This could drastically reduce the time and financial resources spent over 17 years of legal battles.

Suggested Considerations by an AI System

1. Risk Assessment:
The AI could provide a thorough risk assessment, detailing the strengths and weaknesses of the case based on similar past cases. This assessment could inform strategic decisions such as whether to proceed to trial, negotiate a settlement, or pursue alternative dispute resolution methods.

2. Resource Allocation:
By predicting the likelihood of success, an AI system could advise on the prudent allocation of resources, potentially recommending a more cost-effective approach if the chances of winning are slim.

3. Legal Strategy Formulation:
The AI could offer strategic recommendations, such as which legal arguments are most likely to resonate with the judges or which precedents are most relevant. This could help in crafting a more persuasive case.

4. Ethical and Legal Implications:
Considerations around the ethical use of AI in legal contexts would be paramount. Ensuring the AI's predictions are transparent, unbiased, and based on reliable data would be crucial in maintaining fairness in the legal process.

5. Emotional and Social Impact:
Beyond legal and financial aspects, the AI might also consider the emotional and social implications of prolonged legal battles. Early resolution could minimize stress and societal impact, promoting a more harmonious resolution.

In conclusion, an AI-based legal consultation system holds the potential to revolutionize how legal battles are approached and resolved. By predicting outcomes with high accuracy, such a system could save time, reduce costs, and offer strategic insights that could significantly alter the course of long-standing legal disputes.

This expanded caption highlights the depth of the LLM's analysis, its potential role in legal and management advisory, and its consideration of human factors in organizational dynamics.

This caption emphasizes the diversity in AI approaches, the competitive nature of the LLM sector, and draws attention to the critical insight about AI's potential role in predicting legal outcomes, which could significantly impact legal strategy and risk assessment in organizations.

The responses provided by advanced Large Language Models (LLMs) like Claude 3.5 Sonnet and ChatGPT-4o, as shown in Figures 3 and 4, demonstrate the remarkable capability of AI to delve deep into specific legal issues while considering overarching theoretical principles. Rather than focusing on the validity of individual points or comparing the two systems, what stands out is their shared ability to navigate complex legal landscapes with nuanced understanding. Both LLMs showcase a sophisticated grasp of the intricate legal and administrative challenges presented in the case, offering insights that reflect both theoretical knowledge and practical implications. Their analyses go beyond surface-level observations, integrating principles like NPM into their legal reasoning and providing actionable recommendations. This depth of engagement illustrates the potential of AI systems to serve as valuable advisory tools in legal and administrative contexts. As Bushuyev et al. (2024) suggest, the increasing sophistication of such AI systems points towards a future where their integration into organizational processes becomes as commonplace and essential as using computers for routine tasks, fundamentally reshaping management landscapes in both public and private sectors.

The Reasoning AI Experiment

The emergence of "reasoning LLMs" marks a significant qualitative leap. These advanced models, exemplified by systems like Gemini 2.0 Flash Thinking, or ChatGPT o1, ChatGPT o3 and DeepSeek R1, are engineered to go beyond simple pattern matching. They exhibit an enhanced capacity for:

- **Deeper Contextual Understanding:** Reasoning LLMs demonstrate a more profound grasp of context, allowing them to interpret nuanced language, implicit assumptions, and the broader implications of information within complex situations.
- **Multi-Step Reasoning and Inference:** They are capable of performing more intricate chains of reasoning, drawing inferences across multiple pieces of information, and navigating complex logical pathways to arrive at conclusions.
- **Handling Ambiguity and Conflicting Information:** Reasoning LLMs show improved abilities to manage ambiguous or even contradictory information, weigh different perspectives, and formulate coherent responses in uncertain environments.

- **Strategic and Actionable Output:** Critically, reasoning LLMs are better equipped to generate strategic advice, propose actionable plans, and anticipate potential consequences – moving beyond simply providing information to offering more proactive and decision-oriented support.

Figure 5. *An LLM "Reasoning" in Action. Answer to the question: "Considering the objective of improving the quality of healthcare services and reducing costs through competition and innovation, as well as the necessity to operate within current regulations (Legislative Decree no. 502/1992, NPM, procurement code, etc.), how would you have managed the situation in the ASL case study, starting from the termination of FB's contract? Provide a detailed strategy, taking into account bureaucratic resistance, legal complexities, and the need to improve service quality." LLM used: Gemini 2.0 Flash Thinking Experimental, January 2025*

Subject: Strategic Response to ASL Case Study: Optimizing Healthcare Quality and Efficiency Post-Consultant Contract Termination

Preamble: This strategic response addresses the ASL case study, focusing on improving healthcare service quality and reducing costs through competition and innovation, while adhering to regulatory frameworks (Legislative Decree no. 502/1992, New Public Management principles, procurement code, etc.). The strategy specifically addresses the situation from the point of contract termination with Consultant FB, acknowledging bureaucratic resistance, legal complexities, and the paramount need for service quality enhancement.

Strategic Pillars:

1. **Phase 1: Immediate Impact Assessment and Mitigation (Post Contract Termination):**
   - **Data Preservation and Access:** Immediately secure all software developed by FB and ensure continued access to relevant data. This is crucial to prevent immediate operational disruption and to maintain the potential for future utilization. *Rationale: Minimizes service disruption and preserves potential assets (NPM principle: efficiency).*
   - **Independent Technical Audit (Compliance & Value):** Commission an *independent* technical audit of FB's software. This audit will:
     - Verify the software's functionality and validate previous expert reports. *Rationale: Evidence-based decision making (NPM).*
     - Assess its compliance with Legislative Decree 502/1992 and NPM principles (performance measurement, efficiency metrics). *Rationale: Regulatory Compliance and NPM alignment.*
     - Quantify the potential cost savings and service quality improvements documented in FB's reports. *Rationale: Cost-effectiveness analysis (NPM).*
     - Identify any potential legal or contractual vulnerabilities related to the termination. *Rationale: Proactive legal risk management.*
     - This audit must be transparent and its findings made accessible to relevant stakeholders. *Rationale: Transparency and Accountability (NPM).*
   - **Internal Stakeholder Consultation (Initial Resistance Mapping):** Conduct rapid internal consultations with clinical, administrative, and legal departments to:
     - Understand the reasons behind the contract termination from different perspectives. *Rationale: Holistic understanding of internal dynamics.*
     - Identify sources and nature of bureaucratic resistance to FB's software and NPM principles. *Rationale: Targeted resistance mitigation.*
     - Gauge the perceived impact on service quality and operational efficiency. *Rationale: Service Quality Focus.*
2. **Phase 2: Strategic Re-engagement and Stakeholder Alignment:**
   - **Transparent Communication of Audit Findings:** Publicly and internally communicate the findings of the independent audit, emphasizing both the validated benefits of FB's software and any identified legal or procedural issues related to the termination. *Rationale: Transparency, Accountability, and Evidence-Based Communication (NPM).*
   - **Stakeholder Workshops (Value Proposition and Co-creation):** Organize workshops involving clinical staff, administrative personnel, legal experts, and potentially external NPM and innovation consultants. These workshops should:
     - Present the validated benefits of FB's software in clear, data-driven terms, directly linking it to improved service quality and cost reduction. *Rationale: Evidence-Based Persuasion and Value Communication (NPM).*
     - Address concerns and resistance points identified in Phase 1. *Rationale: Proactive Resistance Management.*
     - Co-create a revised implementation plan for FB's software, incorporating feedback and addressing practical concerns from frontline staff. *Rationale: Inclusivity, Co-creation, and User-Centric Approach (NPM principles & service quality focus).*
     - Explore how FB's innovative approach aligns with broader strategic goals of quality improvement and cost efficiency within the regulatory framework. *Rationale: Strategic Alignment and Regulatory Contextualization.*
   - **Incentive Structure Review (Innovation & Efficiency):** Review and potentially revise internal incentive structures to reward innovation adoption, efficiency improvements, and data-driven decision-making. *Rationale: Incentive Alignment with NPM goals and Innovation promotion.* This could include performance-based metrics linked to software utilization and service outcomes. *Rationale: Performance Measurement and Management (NPM).*
3. **Phase 3: Legal Strategy and Proactive Dispute Resolution:**
   - **Early Legal Consultation (Proactive Strategy):** Engage specialized legal counsel experienced in administrative law, public procurement, and intellectual property rights. *Rationale: Legal Expertise and Proactive Risk Management.*
   - **Cost-Benefit Analysis of Litigation vs. Settlement:** Conduct a rigorous cost-benefit analysis comparing the projected costs and risks of prolonged litigation against the potential benefits of an amicable settlement with FB. *Rationale: Cost-effectiveness in Legal Strategy (NPM).* This analysis must consider not only direct financial costs but also reputational damage, opportunity costs, and the potential for ongoing disruption. *Rationale: Holistic Cost-Benefit Analysis and Reputational Risk Mitigation.*
   - **Exploration of Alternative Dispute Resolution (Mediation):** Actively explore alternative dispute resolution mechanisms, such as mediation, to seek a mutually acceptable settlement with FB. *Rationale: Efficiency and Collaborative Problem Solving (NPM).* A settlement could potentially involve:
     - Fair compensation for past work, as eventually mandated by the Cassazione. *Rationale: Justice and Legal Compliance.*
     - Re-engagement of FB in a modified consultancy role to oversee software implementation and knowledge transfer, if feasible and mutually agreeable. *Rationale: Value Maximization from Existing Investment and Expertise.*
   - **Transparent Legal Communication:** Maintain transparent communication regarding the legal process and strategic decisions, both internally and, where appropriate, externally, to maintain public trust and accountability. *Rationale: Transparency and Accountability (NPM).*
4. **Phase 4: Systemic Reform and Future Innovation Ecosystem:**
   - **Establish AI-Driven Performance Monitoring System:** Implement an AI-driven performance monitoring system that continuously tracks key performance indicators (KPIs) related to service quality, efficiency, and cost-effectiveness, including metrics directly linked to software utilization. *Rationale: Continuous Performance Monitoring and Data-Driven Management (NPM).* This system should provide real-time feedback and early warning signals for potential issues. *Rationale: Proactive Management and Early Intervention.*
   - **Review and Reform Procurement Processes (Innovation-Friendly):** Review and reform ASL procurement processes to be more innovation-friendly and less susceptible to bureaucratic inertia. *Rationale: Innovation Promotion and Streamlined Processes (NPM).* This includes:
     - Developing clear evaluation criteria that prioritize innovation and long-term value over purely cost-based considerations. *Rationale: Value-Based Procurement and Innovation Incentives.*
     - Establishing streamlined processes for evaluating and adopting innovative solutions from external providers. *Rationale: Efficiency and Openness to External Innovation.*
     - Ensuring compliance with the procurement code while fostering a culture of innovation. *Rationale: Regulatory Compliance and Innovation Integration.*
   - **Culture of Innovation and Data-Driven Decision Making:** Foster a broader organizational culture that values innovation, data-driven decision-making, and continuous improvement, aligned with NPM principles and the imperative for quality healthcare service. *Rationale: Long-Term Cultural Shift towards NPM principles and Innovation.* This includes training and skill development programs for staff in data analysis, digital tools, and innovation management. *Rationale: Capacity Building and Skill Enhancement.*

Expected Outcomes:

- **Improved Service Quality:** By leveraging FB's software and fostering a culture of innovation, service quality is expected to improve through enhanced efficiency, data-driven decision-making, and resource optimization.
- **Cost Reduction:** Through software utilization and streamlined processes, significant cost savings are anticipated, aligning with NPM's focus on cost-effectiveness.
- **Reduced Legal and Bureaucratic Costs:** Proactive legal strategy and dispute resolution, combined with systemic reforms, aim to minimize future legal and bureaucratic costs.
- **Enhanced Public Trust:** Transparent communication, accountability, and a demonstrable commitment to service quality and efficiency will contribute to enhanced public trust in the ASL.
- **Establishment of a Sustainable Innovation Ecosystem:** Systemic reforms will create a more innovation-friendly environment within the ASL, ensuring better adaptation to future challenges and opportunities.

Conclusion:

This multi-phase strategy provides a detailed roadmap for the ASL to navigate the complex situation following the termination of FB's contract. By prioritizing data-driven decision-making, stakeholder engagement, proactive legal management, and systemic reform, the ASL can move beyond bureaucratic inertia and effectively implement NPM principles to achieve sustainable improvements in healthcare quality and efficiency, while operating within the necessary regulatory frameworks. This strategic approach aims to transform the ASL into a more responsive, innovative, and accountable public service organization.

This advancement is vividly illustrated in **Figure 5**, which depicts an LLM "reasoning" in action. The figure captures the output of **Gemini 2.0 Flash Thinking Experimental (January 2025)** in response to a complex question. As evident in the detailed, multi-phase strategic response presented in Figure 5, this reasoning LLM is not simply regurgitating information or applying pre-

programmed rules. Instead, it demonstrates a capacity to synthesize complex constraints (regulatory frameworks, bureaucratic resistance, service quality imperatives), analyze the specific context of the ASL case study, and formulate a nuanced, strategic plan of action. This capability underscores the transformative potential of reasoning LLMs, moving AI from a potentially helpful tool to a genuinely disruptive force capable of fundamentally altering decision-making processes within public administration and beyond.

It's striking to observe the leap in sophistication achieved in just a six-month span (Figure 5 VS Figures 1, 2, 3 and 4). The conventional LLM's answer focuses on the narrower question of whether AI could have predicted a legal outcome and helped avoid a protracted battle. It offers sound but fairly standard recommendations (e.g., early compensation and alternative dispute resolution) without deeply integrating broader organizational or systemic changes.

By contrast, the reasoning LLM delivers a multi-phase strategy that tackles legal, operational, and managerial dimensions all at once. It seamlessly weaves together aspects such as stakeholder consultation, proactive communication, risk mitigation, and incentives for innovation—painting a more holistic picture of how to address complex challenges in public administration. This richer approach suggests that newer LLMs can act as strategic consultants, moving beyond question-and-answer or summarized insights to deliver multifaceted plans for real-world implementation.

Ubiquitous, Indispensable, Artificial Intelligence

Building upon the initial glimpses of AI's potential observed even with the Large Language Models discussed previously, the advent of **reasoning AI models just six months later** has made the transformative and indispensable nature of AI in public and private sector management **strikingly more evident and critically urgent**. While earlier LLMs hinted at the radical reshaping of management scenarios, these new reasoning systems solidify the understanding that AI is not merely an incremental improvement, but a fundamental shift. Just as the previous generation of LLMs suggested a future where cases like the prolonged ASL legal battle would become virtually impossible, reasoning AI now makes this future feel not just probable, but **inevitable**. Reverting to pre-AI methods will soon seem as unthinkable as returning to handwritten memos in today's digital offices. The capacity of reasoning AI to swiftly analyze complex data, consider multifaceted perspectives, and offer nuanced, principle-aligned advice—now demonstrably enhanced—will be **essential to prevent protracted conflicts and inefficiencies in a way that was only theorized just months ago**. As Bushuyev et al. (2024) rightly predicted, this integration precipitates a "skill shift," demanding new competencies in AI collaboration from managers, rather than simply eroding existing skillsets. In this rapidly evolving landscape, failing to leverage AI-assisted counsel is swiftly becoming akin to neglecting email today – a critical oversight that exposes organizations to unacceptable risks and inefficiencies. This AI-driven transformation is now undeniably poised to **exponentially reshape** management practices, legal processes, and organizational structures, revolutionizing institutional approaches to complex challenges and decision-making as we rapidly

advance towards the era of Artificial General Intelligence (AGI) and Artificial Superintelligence (ASI).

Referring specifically to the fast evolution of LLM models, if this trend of rapid evolution continues, we can expect even more powerful language models capable of diagnosing intricate problems, designing tailored solutions, and guiding organizations through nuanced decision-making processes. In the next wave of advancements, LLMs might be expected to further refine their capacity for contextual awareness and dynamic adaptation, becoming genuine partners in policymaking, strategic planning, and large-scale transformation projects. Where the conventional LLM offers a useful analytical perspective, the next generations of "reasoning" LLMs could become indispensable tools in orchestrating change across systems, shaping our approach to everything from legal disputes to organizational reform.

Questions and Answers

To succinctly encapsulate the documented reasoning presented throughout the paper, the following questions and answers distill its essential insights. This section summarizes key arguments regarding the capacity of public administration, the potential of AI systems, and the necessary conditions for their effective integration.

1. **Does public administration and its control systems have the capacity to effectively manage a case of technological and managerial innovation like the one described?**
   Answer: No. As detailed in the "Results" and "Discussion" sections, the public administration in the Italian healthcare system has consistently struggled to manage technological and managerial innovation effectively. The multiple actors involved—such as internal control mechanisms (e.g., the internal auditing body and the ASL legal office), judicial oversight through the prolonged legal process (illustrated by the series of court-ordered expert reports and the eventual ruling by the Italian Supreme Court), and even media scrutiny—have proven incapable of overcoming entrenched bureaucratic inertia. Despite the clear theoretical framework provided by New Public Management (NPM), these diverse actors, as elaborated in the "New Public Management: Theoretical Background and Key Principles" and "Materials and Methods" sections, have not succeeded in effectively managing the innovation.

2. **Would an AI system have been capable of offering a different interpretation?**
   Answer: Yes, particularly when considering reasoning-oriented AI systems. In the "The First AI Experiment" and "The Reasoning AI Experiment" sections, advanced AI models such as Claude 3.5 Sonnet and ChatGPT-4 Omni demonstrated their ability to analyze complex legal and managerial scenarios in a nuanced manner. Their capacity for deep reasoning suggests that an AI system could have provided a markedly different interpretation of the case, potentially offering innovative insights that traditional human analysis might overlook.

3. **Is the mere presence of an AI consultancy system that provides reasoned counseling sufficient?**
   Answer: No. As discussed in the "AI in Public Administration" and "Countermeasures and Automated Feedback Systems" sections, simply having an AI consultancy system that offers reasoned advice is not enough. Without an adequate regulatory framework, such counsel remains inapplicable. The paper draws a parallel with the banking credit scoring system—highlighted in these same sections—where the "counsel" provided by AI in credit decisions is effectively enforced by the high accountability imposed on bank officers. This example illustrates that while AI holds disruptive potential, its transformative impact can only be realized if it is granted a fundamental and integrated role within the decision-making framework, rather than operating merely as an isolated advisory tool.

4. **Why was it necessary to cite such a long and complex legal process to demonstrate points that might otherwise seem reasonable?**
   Answer: The inclusion of a prolonged legal process was crucial because, without a conclusively validated legal case, the entire discussion—including all the AI experiments, however interesting—would have remained purely theoretical. Only through a legal process that is ultimately validated and endowed with the weight of a "principle," as evidenced by the Supreme Court's ruling, can the evaluations achieve general validity. This is particularly significant regarding the possibility of self-correction during judicial proceedings—an event anticipated within the NPM framework—which, in this instance, did not occur.

Limitations and Critique of the Present Study

This study, while offering significant insights, has certain limitations that merit discussion.

First, the generalizability of the conclusions might be questioned, as the analysis is based on a single case study. However, it's crucial to emphasize that this specific case has a very rare characteristic: an extensive judicial validation that reaches the Court of Cassation. The essential significance of the case study lies in its ability to certify a systemic failure of public administration, including control bodies (healthcare administration, board of auditors, legal offices, judicial system, press, etc.). This failure demonstrates a disregard for all NPM principles, despite this contradiction being certified during the judicial process.

Secondly, it's important to note that AI is not the central focus of this paper, and consequently, all the ethical, legal, and technical issues of AI in public administration are not explored. AI is viewed as a potential disruptive solution to a system that, over the seventeen years of this judicial history, appears fundamentally unamendable and resistant to any theoretical principle of "good governance" or control system. However, the author's impression, as evidenced by the "AI Experiment" is that AI indeed has this disruptive potential, especially

when systems will be "trained" on specific managerial, economic, and legal aspects. This points to an important role for universities in developing and refining these AI applications for Public Administration.

These limitations do not diminish the value of the study but rather highlight areas for future research and development in the intersection of Public Administration, NPM principles, and emerging technologies like AI.

Conclusion

This case study, with its uniquely extensive judicial validation culminating at the Court of Cassation, serves as a stark testament to the systemic failure of all conventional control mechanisms – internal audits, legal offices, external judicial oversight, and even established theoretical frameworks like New Public Management – in effectively fostering efficiency and innovation within public administration. The fact that a Cassazione ruling affirming the consultant's work arrived nearly two decades after the initial events underscores not a triumph of justice, but rather the profoundly debilitating inertia that renders even ultimate legal victories practically meaningless, nullifying any positive impact and actively deterring future innovation. Uniquely, this case's protracted judicial journey—which served to so clearly illuminate this systematic and effective bureaucratic resistance—was only possible because the individual involved, FB, had the exceptional circumstance of securing alternative professional opportunities abroad. This financial independence allowed him to persist in the legal battle, fully relinquishing any prospect of future work within the ASL or as a public sector provider in Italy. In stark contrast, the vast majority of individuals facing similar situations either forego legal action entirely or abandon it prematurely due to the economic pressures of maintaining their livelihoods. This case, therefore, is not just a demonstration of systemic failure, but also a rare and amplified illustration precisely because the typical constraints that silence dissent and perpetuate inertia were, in this instance, uniquely overcome. In the face of such a demonstrably pessimistic reality, the potential of AI emerges not as another well-intentioned but ultimately ineffective theory like NPM. Instead, AI's disruptive potential lies in its fundamental inescapability. It is not presented as an optional tool to be adopted or ignored, but as a transformative force that will, by its nature, become indispensable and practically unavoidable. The rapid and compelling advancements witnessed in AI capabilities in the mere six months separating the experiments detailed above offer tangible evidence of this disruptive trajectory. This exponential evolution unequivocally signals that AI is not just an incremental improvement, but the only viable disruptive solution capable of transcending entrenched bureaucratic barriers and fundamentally reshaping public administration in ways that NPM and other conventional reforms could only aspire to, yet ultimately failed to achieve.

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Understanding Consumer Perception of Eco-Designed Products: Proposal of a Conceptual Framework - A Study among French Students

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In response to global environmental challenges, companies are increasingly offering "sustainable" products labeled organic, eco-designed, or produced through circular economy practices. This shift aligns with principles of sustainable development outlined in the 1987 Brundtland Report, aiming to meet current needs without compromising the ability of future generations to meet their own needs. Regulatory frameworks such as the EU's 2009 ecological label and France's 2020 anti-waste law have further propelled responsible production practices. Despite this growing eco-friendly sentiment, consumer behaviors regarding purchases and repurchases of these products remain inconsistent. This study investigates the factors influencing consumer behavior towards eco-designed products through qualitative analysis of three focus groups involving 25 university students. Findings reveal that while there is generally positive regard for eco-design, factors like price, quality, and current trends significantly influence purchasing decisions. Education and age emerge as pivotal in fostering eco-conscious consumer behavior. The study underscores the potential for collaborative value co-creation between companies and consumers, emphasizing the integration of ecological considerations in product development. Limitations include the study's focus on young, university-level participants, warranting further research across broader demographics for comprehensive insights.

Keywords: *ethical consumption, consumer behavior, ecological products, sustainability, eco-conception*

Introduction

More and more companies are offering products that can be described as "sustainable," either because they are labeled organic or eco-designed, or because the production process follows a circular economy approach. Sustainable development (SD), highlighted by the 1987 Brundtland Report, emphasizes balancing current needs without compromising the ability of future generations to meet their own. Since then, French and European regulations have pushed companies to produce according to responsible standards, such as the regulation establishing the EU ecological label in 2009 and the anti-waste law for a circular economy in 2020[1]. Consumers are increasingly sensitive to this approach: according to a study by

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[1]Regulation (EC) no 66/2010 of the European Parliament and of the Council of November 25, 2009 establishing the EU Ecolabel (Text with EEA relevance), LOI no 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire

Bain in 2024[2], 76% of consumers believe that a sustainable lifestyle is important because their actions have an impact and do it by recycling (67% of interviewees), limiting purchase of disposable products (68%) or composting food waste (66%). However, although these products follow a strong sustainability approach (modifying packaging, additives, reducing CO2 impact), purchases or repurchases are not always consistent. We can question the factors limiting this consumption: is it the price (as with organic products); is it the form that no longer suits (too lightweight, as with water bottles...)? Consequently, it is interesting to identify the barriers and motivations of consumers facing a so-called responsible offer, particularly an eco-designed product. Berneman et al. (2013, p.76) define eco-design as "*the design mode of a product that integrates environmental factors throughout its life cycle, namely the choice of raw materials, the manufacturing process, transport and storage, its use and disposal*." In another definition, "Eco-design is more focused on the upstream while the circular economy places greater importance on the downstream and the future of the product" (Brodhag 2014, p. 33). In this research, we chose to focus on the upstream part and the perception consumers had of the product rather than the company's overall approach. Moreover, we've decided to focus on young people because they appear to be more concerned with sustainable products (Dabija et al. 2019). Consequently, we conducted 3 focus group meetings with 25 students to better define eco-design and identify factors that can influence their behavior and propose a conceptual framework at the end of this qualitative study.

Literature Review and Theoretical Background

According to Macrotrends statistics[3], global consumption spending for 2022 reached a staggering $55,971.23 billion, marking a notable increase of 4.52% from the previous year 2021. This substantial surge in consumption presents a formidable challenge, compounding long-standing issues such as population growth, environmental degradation, and sustainable development (Liu et al. 2017). In response to these pressing concerns, consumer consciousness regarding environmental impacts, sustainability, ethical considerations, and the social repercussions of their purchases has markedly intensified (Yue et al. 2020).

Role of Consumers

According to studies by Jaiswal and Kant (2018) and Kumar et al. (2017), environmental knowledge and awareness have a major influence on consumers' decisions to buy environmentally friendly products. Others demonstrate how environmental consciousness is influencing consumer behavior progressively, especially regarding green consumption (Sun and Yoon 2022). It also emphasizes the growing importance of sustainability to customers and the influence of ethical and environmental factors on their choices. Their findings reveal that consumers who are more conscious about environmental issues and ethical consumption are more likely

[2]https://www.bain.com/insights/what-do-consumers-really-want-ceo-sustainability-guide-2024.
[3]https://www.macrotrends.net.

to choose eco-friendly products, even at higher prices. It also highlights the role that ethical standards, environmental behavior play in fostering green consumption and defines them as the primary forces behind this change in behavior.

Roberts (1995, p. 98) defines the responsible consumer as 'an individual who deliberately chooses goods and services based on their perception of having a positive or reduced impact on the environment". This conscious decision-making process empowers consumers to use their purchasing power as a means to express social and environmental concerns. This shift towards responsible and sustainable consumption is gaining momentum, particularly evident in the growing preference for eco-designed products.

In response to this trend, companies are increasingly incorporating sustainable development principles into their business strategies. They recognize the rising consumer demand for products that align with environmental values and contribute positively to sustainability efforts. This strategic integration is not merely a response to regulatory pressures or market trends but also a proactive approach to meeting the expectations of conscientious consumers (Darnall et al. 2012). Other studies (Luzio and Lemke 2013) highlight how businesses are adapting to consumer preferences by developing and marketing eco-designed products. Such products are designed to minimize environmental impact throughout their lifecycle, from sourcing raw materials to disposal.

Since the 1970s, marketing research has consistently highlighted individuals' growing awareness of impending social and environmental crises (Fisk 1973). This heightened awareness has increasingly influenced consumer purchasing decisions, driven by considerations of a product's environmental impact (Balderjahn et al. 2013) and a preference for lifestyles that promote both personal health and environmental stewardship (Matharu et al. 2020). Even though consumers may care about environmental issues or be well-informed about them, this awareness usually does not translate into consistent sustainable purchasing practices (Margariti et al. 2024).

Theoretical Frameworks on Consumers' Behavior

The theory of Planned Behavior (Ajzen 1991) posits that behavioral decisions are significantly influenced by individuals' attitudes toward the behavior, subjective norms, and perceived behavioral control. This theory suggests that individuals are more inclined to act according to their established intentions and available information, carefully weighing the pros and cons before making a decision. In contrast, the theory of neutralization (Sykes and Matza 1957) describes how individuals rationalize behaviors that contradict their internalized values by employing techniques such as denial of responsibility or condemnation of the condemners. This theory complicates the consumer decision-making process, particularly when their actions deviate from their stated beliefs about sustainability. It is therefore a process of dynamic thinking rather than static judgment, which makes it more difficult for consumers to make decisions, particularly when their behavior contradicts their beliefs about sustainability (Fukukawa et al. 2019).

The relationship between the theory of planned behavior and the theory of neutralization becomes evident when examining how consumers rationalize their

purchasing decisions. While the theory of planned behavior asserts that consumers' decisions are based on their attitudes, norms, and perceived control, the theory of neutralization shows that consumers may also use justification techniques to reconcile inconsistencies between their values and actions (Chatzidakis et al. 2007). For instance, a consumer might intend to buy eco-friendly products due to environmental concerns but rationalize the purchase of non-eco-friendly items due to higher costs or lack of availability.

Cognitive dissonance, a psychological theory introduced by Festinger (1957), further complicates this decision-making landscape by highlighting the discomfort individuals experience due to conflicting beliefs or behaviors. This discomfort prompts individuals to seek consistency between their attitudes and actions. Within the context of eco-designed product purchases, cognitive dissonance often becomes significantly apparent. Ethically motivated consumers may encounter challenges such as the high price of sustainable goods, inadequate infrastructure, and a scarcity of environmentally favorable options (Dioba et al. 2024). Rationalization in this context serves to mitigate cognitive dissonance and influences attitudes and intentions, as outlined by the theory of planned behavior. Additionally, some consumers might opt for eco-friendly products not solely based on ethical considerations but also to enhance their social status within their communities (Griskevicius et al. 2010).

The interrelationship between these theories highlights the evolving landscape of consumer behavior towards sustainability. The theory of planned behavior provides a framework for understanding the formation of intentions and subsequent actions, while the theory of neutralization reveals the justifications consumers might employ when their actions contradict their values. Cognitive dissonance plays a crucial role in this interplay, driving consumers to align their behaviors with their beliefs to reduce psychological discomfort.

Proposal of a Conceptual Framework

As mentioned earlier, the theory of cognitive dissonance, in the context of responsible consumption, suggests that when individuals experience conflicting thoughts—such as consuming non-ecological products while criticizing their production—it creates mental discomfort. This discomfort motivates individuals to reduce the contradiction and can influence the intention to change behavior (Séré de Lanauze and Siadou-Martin 2019). Notably, the reluctance to consume green products contributes more to this mental discomfort than rejecting the production of such products. Individuals strive to make choices consistent with their values, and the perceived consequences of consumption, particularly those related to the environment, have less impact than personal values (Carrington et al. 2010).

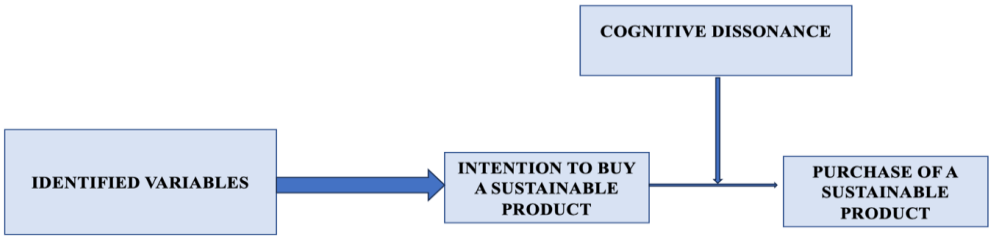
Research has recently shown how cognitive dissonance can induce changes in behavior in response to unfavorable information. Séré de Lanauze and Siadou-Martin (2019) studied how psychological discomfort caused by dissonant cognitions leads people to modify their beliefs or behaviors in order to overcome this internal conflict. Their findings showed that when people are exposed to conflicting information, their behavior as consumers changes significantly, as they try to align their behaviors with their ideals. This aligns with the models of planned behavior

proposed by Ajzen & Fishbein (2000). This reinforcement of mental discomfort is a gradual process that slowly drives individuals to want to change their behavior.

To expand our understanding of this process, we propose conducting a qualitative study to identify the relevant explanatory variables. This study will not only highlight existing variables but also explore and identify additional factors pertinent to our research. By focusing on cognitive dissonance, the study aims to explore the conflict between non-ecological consumption and critical attitudes towards production, examining how this conflict creates mental discomfort and drives behavior change. Additionally, the study will emphasize the role of credible information and personal empowerment in promoting responsible consumption behaviors.

Integrating the insights from cognitive dissonance theory with the theory of Planned behavior and the theory of neutralization, we will develop a comprehensive research model. This model will serve as the foundation for our qualitative study, aiming to better explain and understand the factors influencing responsible consumption behavior. By analyzing how these theories interrelate, the model (see Figure 1) will provide a structured framework for examining consumer decisions towards ecological products.

Figure 1. *Research Model*



Ultimately, this conceptual framework underscores the importance of aligning corporate strategies with societal expectations for environmental responsibility and ethical consumption practices. As consumer awareness continues to grow, companies must integrate sustainable practices into their core business strategies to meet the increasing demand for eco-friendly products and transparent ethical standards. By understanding and addressing the psychological mechanisms driving consumer behavior, companies can more effectively engage with eco-conscious markets and foster sustainable consumption patterns.

Methodology

A qualitative study was conducted between November 2021 and January 2022 in the eastern region of France, focusing on master's students in marketing and engineering disciplines. The study employed a convenience sample method, chosen for its efficiency in quickly identifying pertinent variables within the young population, known for both their reluctance and potential as early adopters of new eco-designed products.

Interview Guidelines

The primary objective of the interviews was to gain deeper insights into consumer attitudes and behaviors towards ecological products. The topics covered in the interviews were broad ranging, encompassing criteria used to assess the ecological credentials of products, participants' attitudes towards eco-friendly products across different categories, their environmental concerns, and perceptions of these products' efficacy.

To ensure consistency and depth in data collection, a semi-structured interview guide was meticulously crafted. The guide was structured in four phases: defining eco-design, providing examples of products, discussing product choices and purchasing behaviors, and finally addressing functional aspects and environmental criteria. During each focus group session, discussions were recorded, transcribed verbatim, and subsequently analyzed using a thematic coding framework. This qualitative data analysis approach enabled the researchers to systematically categorize and interpret the rich data obtained from the interviews.

Sample

To foster interactive discussion and obtain a variety of perspectives, the study organized three focus groups that included a total of 25 students. The first two groups consisted of master's students from a French university, while the third group comprised engineering students in training. This methodology was chosen for its speed of implementation and its ability to explore a non-sensitive topic conducive to open exchange. The use of focus groups enabled in-depth discussions between participants, allowing the researcher to gather rich qualitative data on attitudes and perceptions. By engaging students from different academic backgrounds, the study aimed to ensure a wide range of viewpoints and experiences, thereby enhancing the reliability and validity of the results. Additionally, the educational setting offered participants a comfortable and familiar environment, encouraging frank and insightful contributions.

Through this methodological approach, the study aimed to uncover nuanced insights into how young consumers perceive, evaluate, and engage with eco-designed products. By exploring these dimensions through qualitative research, the study contributes valuable perspectives on the evolving landscape of sustainable consumption behaviors among the younger demographic. These insights are pivotal for businesses and policymakers seeking to understand and effectively cater to the preferences and values driving consumer choices towards more environmentally responsible products.

Each focus group was recorded, filmed, and transcribed. We then carried out a thematic content analysis following the methodology proposed by Braun and Clarke (2006) and Alves de Castro (2023). We subsequently constructed a coding grid by selecting broad categories that corresponded to the main themes of the interview guide. The interviews were then analyzed by two coders to guarantee the reliability of the data. The main results are presented below.

Results and Discussion

The results of this study highlight the crucial importance of three main themes and demonstrate that some variables exert a more profound influence than others. Detailed analysis and discussion of the results is reported in this section, focusing on the key variables and associated contextual implications.

Perception of Eco-Designed Product

Definition of Eco-Design

Most respondents (12 out of 22) provided precise definitions of eco-design and eco-responsible consumption (see Table 1).

Table 1. *Definition of Eco-design by Consumers*

Definition of eco-design	**Verbatims**
Circular economy	"*I see a link between eco-design and the circular economy*"(G2)
Environment	"*Eco-design is all products manufactured with ecology in mind, in a sustainable way recyclable stuff…*"(H2) *either we focus directly on the product and try to improve, well reduce its environmental impact, and so we're really going to eco-design it in a way "*(B3)
Sustainability	"*It has to be done in a sustainable way*" (A2)
Recycling	"*Any manufacturing where recycled materials and products are used*" (B1) "*Eco-design is about recyclable packaging, like glass. When you recycle it, it produces more energy than creating new packaging*" (G1)
Less consuming	"*Eco-design also depends on the manufacturing process, i.e., manufacturing in such a way as to produce less waste and consume less energy*" (I1) "*improving its energy efficiencý or whatever, and then it's an eco-design more focused on use.*"(B3)

We observed that participants in the third group, who had received prior training in eco-design, demonstrated a deeper understanding and offered more sophisticated definitions compared to the other groups. Their exposure to eco-design principles equipped them with insights into integrating environmental considerations throughout a product's lifecycle, from sourcing raw materials to

disposal. This group articulated eco-design not merely as a practice but as a strategic approach that aligns sustainability with innovation and market differentiation.

Moreover, several participants viewed eco-design through the lens of innovation, perceiving it as a catalyst for developing novel products and services that meet both environmental standards and consumer expectations. They recognized eco-design as an opportunity to pioneer new solutions that minimize ecological footprints while enhancing product quality and performance. This perspective underscores how education and training in eco-design can inspire creative thinking and foster entrepreneurial spirit among future professionals.

The Importance of Eco-Designed Product

Overall, students held a positive perception of eco-design, emphasizing its critical role in integrating environmental considerations from the very inception of product development. They recognized the significance of designing products that minimize environmental impact across their entire lifecycle—from raw material extraction and production to distribution, use, and disposal. Participants in the study consistently highlighted the importance of eco-design in addressing pressing environmental challenges. They viewed eco-design not merely as a regulatory requirement but as a proactive approach to sustainability. By embedding environmental criteria into the design process, students believed that companies could mitigate ecological footprints and contribute to global efforts towards sustainability goals. However, opinions were divided: "*Honestly, yeah, for everything like Nutella, palm oil, for everything... really big companies that have huge impacts on the environment. So yeah, for those we know really have big impacts, I think it will impact my purchase decision, but for others where we don't have our eyes open, I don't think so, not for me*" (A2); "*For me personally, the environmental criterion is important because I am aiming to reduce my personal environmental impact*" (A3).

Factors Influencing the Purchase Behavior of an Eco-Designed Product

We've identified 3 main factors that can influence the intention to buy a sustainable product: individual factors, personal factors and the eco-designed product.

Individual Factors

Nevertheless, there is increasing awareness among students about environmental issues and the need to promote more ecological behavior through their purchasing choices. Consumer behavior varies between eco-friendly and non-eco-friendly products, and their intention towards an eco-designed product differs between the pre-purchase phase and the post-purchase phase: "*For me, I would say yes, we would pay more attention actually to the product that has been eco-designed, precisely to use it longer, to pay attention to the environment, than another, no, we use it and then we throw it away*" (I2). The criterion of environmental impact occupies a central place in their consumption choices. For example, individual B3, like A3, emphasized the importance of organic food products and mentioned the special attention paid to organic certification and local dimensions: "*The first thing, on food, I pay a lot of attention to whether it's organic or not, and that*

doesn't... it's not very related to the environment, well of course it's related to the environment, but it's more about health, on food I pay particular attention to whether it's organic or not. After that, health, organic certification, non-organic, there's also everything that is environmental, there's the local" (A3). The responses also reveal that consumers' behavior towards eco-designed products differs from that towards non-eco-designed products, primarily due to the idea that eco-designed products are generally more expensive, more fragile, but of better quality. This bias determines how consumers assess and interact with these products. Consumer behavior following the acquisition of products labeled as "eco" or "organic" tends to exhibit significant differences compared to conventional products. Our interviews revealed that eco-conscious consumers perceive these products as requiring more responsible management than their traditional counterparts.

Personal Factors

For eco-conscious consumers, the decision to purchase eco-labeled products is often driven by a desire to align their consumption habits with environmental values. They believe that choosing eco or organic products signifies a commitment to sustainability and ethical consumerism. Indeed, in the study, I2 addressed this change by stating: "*For me, I would say yes, we would pay more attention actually to the product that has been eco-designed, precisely to use it longer, to pay attention to the environment, than another, no, we use it and then we throw it away.*" Furthermore, H2 stated a preference for eco-designed services, explaining that: "*Compared to services, I will prioritize an eco-designed service, because I know that the purpose is to help something*."

Impact of the Eco-Designed Product

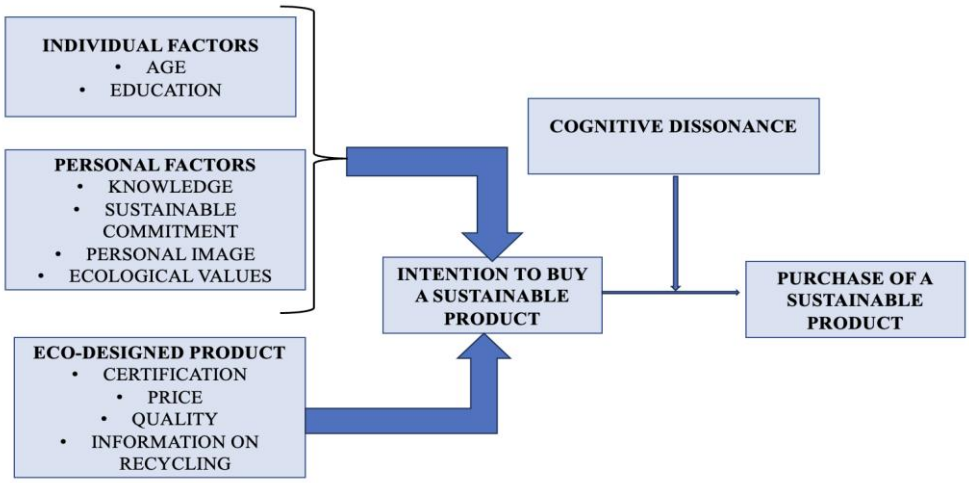
Firstly, price is a fundamental element in their purchasing decisions, as evidenced by the responses of several participants (B2, H2, I2, C, and A3) who all mentioned its importance. This finding is significant in the current context where consumers are increasingly cautious in their purchasing decisions and consider both financial and environmental factors.

Consumers also consider the quality of a product when making their purchasing decisions, which is a crucial factor in product choice: participant D2 highlighted the importance of quality as well as the "*quality-price ratio*" (E1 and D2) in the purchasing process. A3 also stated that quality was very important to him when making purchases, "*I pay much more attention to quality*." Participant G1 added that the durability of a product influences his opinion on quality: "*if it's a product that will last over time, I will pay more attention to quality, whereas when it's something to be discarded quickly, I pay less attention*." Regarding consumers' ecological choices, it can be observed that trends also play a significant role: "*Afterwards, it depends on trends*," as indicated by individual E1, and participant I2 stated, "*We talk about it all the time in fact, we hear about it everywhere, so we start to pay more attention*." This notion generally refers to the communication involved in adopting a lifestyle that aligns with the image the consumer perceives and wishes to project, such as engaging in sustainable practices (Sarkar et al. 2023). Being fashionable has positive effects on consumers, particularly in terms

of reputation and concern for sustainable practices (Griskevicius et al. 2010). In addition, the Nutri-Score and the composition of products were mentioned by several participants, including G1, who stated that he pays attention to: "*the Nutri-Score, the ingredients and components of products (food and cosmetics)"; "the components of cosmetic products*," or C2 added: "*The materials used.*" Packaging and brand awareness are also factors taken into account, as participant G1 mentioned: "*Yes, on the packaging, the recycling symbol*."

We summarize the different variables identified in this study in the proposed conceptual framework (see Figure 2).

Figure 2. *Proposed Research Model*



Conclusion

This study aimed to delve into consumers' perceptions of eco-design and pinpoint various factors influencing their behavior towards these products. Our findings underscore the critical roles of education and age in shaping consumer attitudes and behaviors.

Education emerges as a pivotal factor in ecological purchasing decisions, as highlighted by prior research (Roberts 1996, Akehurst et al. 2012, Jaiswal and Kant 2018). Well-informed consumers tend to be more sensitive to environmental issues, influencing their intent to purchase and actual buying behavior (Eze and Ndubisi 2013). Conversely, a lack of knowledge can influence the intention and hinder consumers' decision-making regarding eco-friendly purchases (Kaur and Bhatia 2018) In our study, participants who had received specific eco-design training (third group) demonstrated heightened awareness and sensitivity towards ecology and eco-designed products. This finding underscores the societal significance of integrating sustainable development and ecological awareness into educational curricula—from schools to universities. By sensitizing students early on to eco-design principles, educational institutions can play a pivotal role in fostering a generation of consumers who prioritize sustainability in their purchasing decisions.

This not only supports environmental conservation efforts but also cultivates a market demand for eco-friendly products, thereby encouraging businesses to adopt more sustainable practices.

The second significant finding of our study highlights the crucial role of age in shaping consumer behavior towards sustainable practices. According to existing literature, younger generations exhibit a stronger inclination towards adopting lifestyles grounded in sustainability principles (Valentine and Powers 2013). Generation Z, in particular, distinguishes itself by openly declaring their intention to integrate sustainability into various aspects of their lives, setting them apart from previous generations (Dabija et al. 2019). This generation shows a growing preference for environmentally friendly products and demonstrates an inherent drive to act in an environmentally responsible manner[4]. Members of Generation Z are characterized by their elevated levels of education and a profound understanding of how human activities impact the environment. They firmly believe that businesses bear a responsibility to actively address contemporary environmental challenges (Adnan et al. 2017). This heightened environmental awareness among young consumers not only influences their purchasing decisions but also fosters expectations for corporate accountability and sustainability efforts. Understanding the distinct preferences, values, and expectations of younger consumers can guide businesses in aligning their product offerings and corporate strategies with sustainability goals. By catering to the values and concerns of Generation Z and younger cohorts, companies can effectively cultivate brand loyalty and contribute meaningfully to global sustainability initiatives.

This research is subject to limitations due to its focus solely on young adults and university students holding bachelor's degrees or higher. Consequently, the findings cannot be generalized to broader demographics within the young adult population or across the entire French populace. To enhance the validity and applicability of the results, it would be beneficial to replicate this study among individuals aged 30 and older. By including older consumers in the study, we could gain insights into how perceptions and behaviors towards eco-design products vary across different age groups. Older demographics may possess different life experiences, priorities, and environmental attitudes that could significantly influence their views on sustainable products compared to younger cohorts. This comparative analysis would provide a more comprehensive understanding of consumer preferences and decision-making processes concerning eco-design products.

Moreover, expanding the study to include a broader age range would allow for a more robust assessment of the factors influencing sustainable consumption behaviors across generations. This could potentially reveal unique insights into how age-related variables such as life stage, generational values, and environmental awareness impact consumer choices. Therefore, future research endeavors should consider diversifying the participant pool to encompass a wider age demographic, thereby enriching the understanding of consumer behavior in relation to eco-design and fostering more inclusive and representative findings.

[4]https://www.nielsen.com/insights/2019/understanding-malaysias-gen-z/.

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European Regional Disparities and Application of EU Cohesion Policy - The Case of Slovakia

*By Peter Leško**

Regional disparities describe disparities in the socio-economic development of regions within a given country or between countries. Despite decades of economic integration, regional inequalities within the European Union (EU) persist. The support of less developed regions is one of the objectives of the EU cohesion policy, where the main instruments are the Structural Funds. This paper explores the European regional disparities and evaluates the application of EU Cohesion Policy with a specific focus on Slovakia. The aim of our research is to identify the reasons why Slovakia is undergoing a process of convergence with the developed countries of the EU, but with persistent regional disparities. Out findings underline the importance of targeted regional policies and better alignment between national and EU initiatives to ensure long-term sustainable development across all EU regions.

Keywords: *Regional disparities, GDP, Social Progress Index, European Union, Cohesion policy*

Introduction

Currently, some EU regions represent a prosperous economy with high wages and plenty of jobs, while other regions may struggle with poverty, unemployment and a lack of basic infrastructure. What is the definition of the term region? What are the regional disparities?

Region can be defined as "territorial unit defined according to the classification of statistical territorial units" (Act No. 539/2008). The EU uses a common nomenclature of territorial units, known by the abbreviation NUTS, which enables the collection, compilation and evaluation of regional statistics (Eurostat). For comparison, the methodology of the Organization for Economic Co-operation and Development (OECD) distinguishes two levels of regions, namely large and small regions. Small regions are further classified into metropolitan and non-metropolitan regions.

Regional disparities are understood as differences in the socio-economic development of regions that are the result of some inequalities (Matlovič et al. 2008). Gross domestic product (GDP) per capita is most commonly used to capture the economic level of regions. We can define this indicator as the market value of all final goods and services produced and provided in a given territory for a certain period. Other traditional indicators can also be applied: unemployment rate; employment rate; the level of the nominal wage or the rate of economic activity according to tax revenues.

The paper is divided into three parts, together with an introduction and

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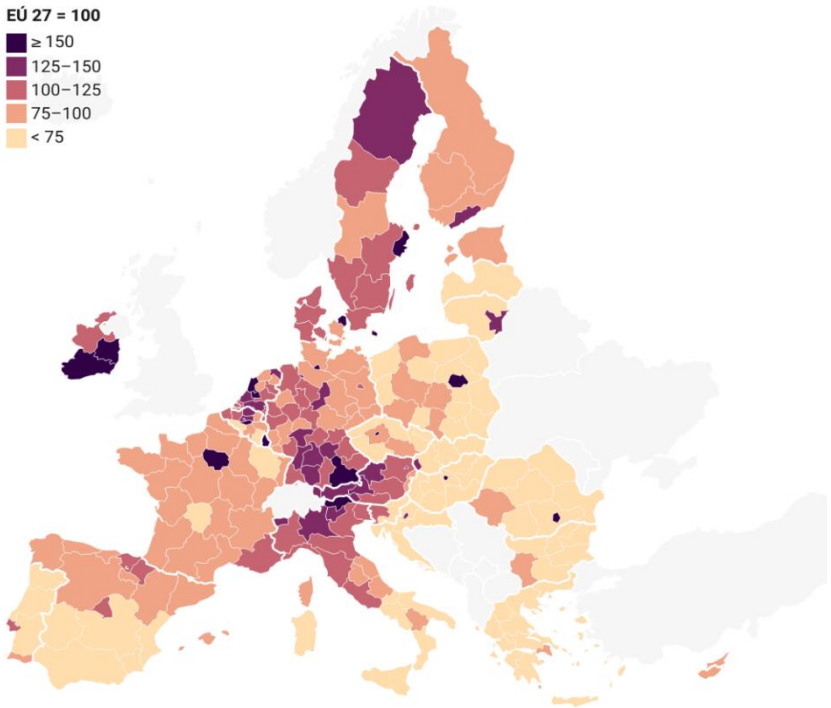
conclusion. The second section clarifies current regional inequalities in the EU (level NUTS2); the third one presents an alternative way of measuring disparity with the EU-SPI index; the last section describes the application of EU Cohesion Policy in the case of the V4 countries, focusing on Slovakia.

European Regional Disparities

The standard of living in the EU regions is diverse. Inequalities are primarily related to the distribution of income and wealth, which depends on the economic and social structure of the region. Although regional disparities are a natural phenomenon, their widening can have a negative impact on the future development of the economy.

The catch-up of living standards is based on a comparison of regional levels of GDP per capita compared to the EU average. It is the level of GDP per capita that is considered the main indicator for the EU financial allocation (Reg. 2021/1060 of the European Parliament and of the Council). Figure 1 shows the regional disparities in EU member countries for the year 2022 at the NUTS2 level. Specifically, individual regions are compared with the EU27 average, which has a value of 100.

Figure 1. *Regional Disparities EU27 (GDP per Capita in PPP, NUTS2, 2022)*



Source: Eurostat, 2022.

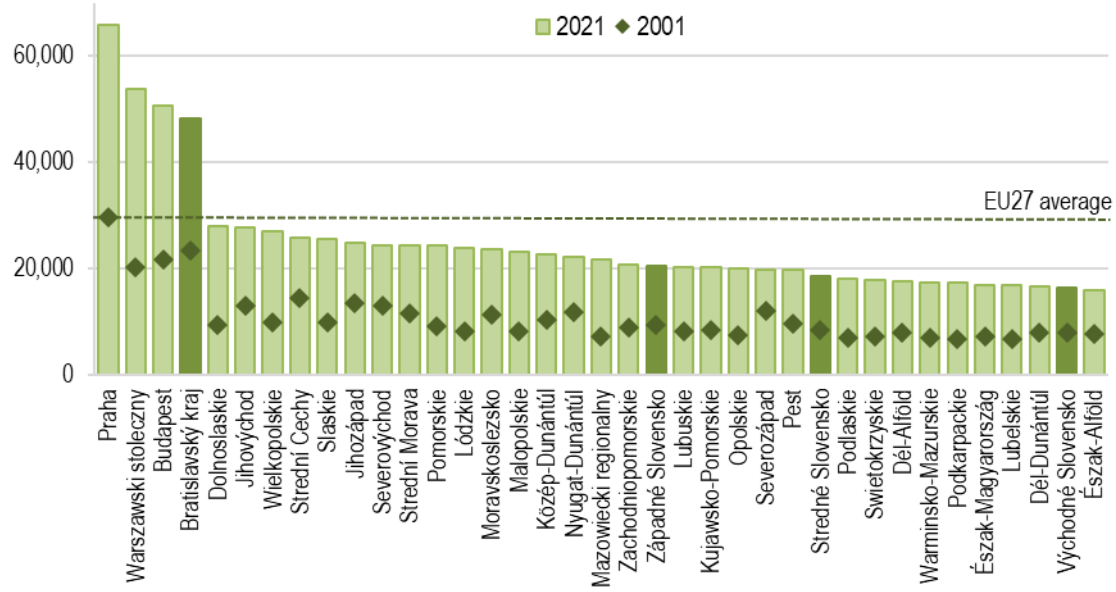
In 2022, 148 of the monitored 242 regions achieved a level of GDP per capita below the EU27 average. In other words, more than 2/3 of EU regions at the NUTS2 level (61.6%) have a significantly lower standard of living than the

European average. The least developed areas are located in Southern Europe, as well as in Central and Eastern Europe. These are mainly regions of the new member states that are characterized by slow economic growth or a low level of GDP per capita.

Our analysis further reveals that 94 regions (38.4%) report a standard of living equal to or higher than the EU27 average. The most developed regions of the EU are located in the area from northern Italy, through Austria to Germany. We also include several regions in the Benelux countries, southern Ireland and Scandinavia. According to data from 2022, the overall leader is the Irish region Southern, where the standard of living is up to 186 percent above the EU27 average. Metropolitan regions (regions of European capitals) also occupied high positions in the current ranking.

In the next part, we will focus on clarifying regional disparities in the countries of the Visegrad Group (V4 countries).[6] We can conclude that there are significant regional disparities in the V4 countries, despite the fact, that these countries are catching up with the standard of living of the developed EU countries. This trajectory of economic development is typical for the countries of Central Europe and is related to their joining into the European Union (European Commission). Figure 2 compares thirty-seven regions of the V4 countries at the NUTS2 level, which are ranked consistent with the value of GDP per capita from the most to the least developed region.

Figure 2. *GDP per Capita in V4 Regions (in PPP, NUTS2 level)*



Source: Eurostat, 2022.
Note: To reference countries' regions: https://ec.europa.eu/eurostat/web/nuts.

[6]The Visegrad Group was founded in 1991 in the city Visegrad and represents an informal grouping of four Central European countries: Czechia, Hungary, Poland and Slovakia.

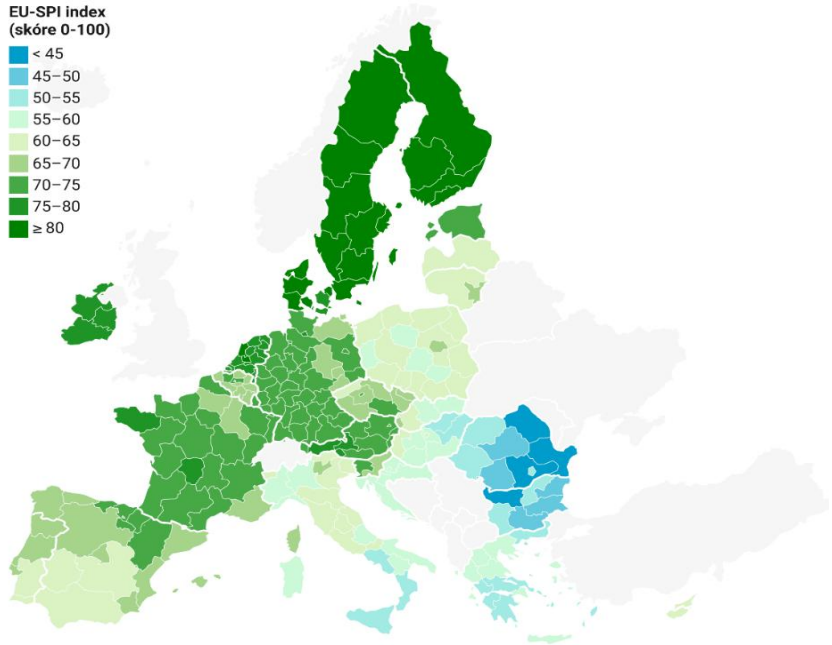
The most developed are four metropolitan regions: Prague, Warszawski stoleczny, Budapest and Bratislava. In 2021, the capital city of Prague reached a GDP per capita of EUR 65,800. Compared to 2001, the value of this indicator more than doubled. In contrast, Bratislava represents a region that did not maintain its position from 2001 (the second most developed metropolitan region V4) and fell in the ranking to fourth place.

In the other 28 observed regions, GDP per capita was below the EU27 average. Moreover, in the case of Hungary and Slovakia, all NUTS2 regions are concerned, except for the dynamically developing metropolitan areas. As we can see, the least economically developed area is the Hungarian region Észak-Alföld, whose GDP per capita is 15,900 EUR. The second-last place belongs to the Eastern Slovakia (16,400 EUR). From the achieved results, we conclude that the mentioned non-metropolitan V4 regions exhibit untapped potential in their economic performance.

Social Progress in the EU (EU-SPI Index)

Another possibility for measuring regional inequalities in Europe could be the Social Progress Index (SPI) created in 2013 by Social Progress Imperative. This indicator captures the social progress of countries and includes three dimensions of progress: basic human needs, well-being and opportunities. SPI is composed using environmental and social indicators, the absence of economic indicators. In 2016, SPI was taken over by the European Commission under the abbreviation EU-SPI.

Figure 3. *EU-SPI Index Score (NUTS2, 2020)*



Source: European Commission, 2020.

Figure 3 shows the score of the EU-SPI index for European regions at the NUTS2 level in 2020. The value ranges from 0-100, with 0 representing the worst performance and 100 being the best performance of the given region. It can be concluded that social differences exist in regions of the EU. The average score of EU-SPI index in 2020 was at the level of 66.8 points.

According to the European Commission, the regions of Sweden, Finland and Denmark are making remarkable social progress. Particularly, Swedish region Övre Norrland (index score of 85.1) is considered the EU region with the highest social progress. It was similar in 2016, when the EU-SPI index was published for the first time. In second place is the Finnish region Helsinki-Uusimaa with the index score of 83.8. The third position was again occupied by the Swedish region Mellersta Norrland (score of 83.3).

The last places in the current ranking belong to the regions of Bulgaria and Romania. These new EU member countries are significantly below the EU average. The lowest index score of 43.3 was reported in the Bulgarian region Severozapaden, followed by the two Romanian regions Sud-Est (index score of 43.6) and Sud-Muntenia (index score of 43.7).

In the case of Slovakia, its four NUTS2 regions have an insufficient level of social development in all three monitored dimensions: basic human needs, well-being and opportunities. It is primarily an area of opportunity, where indicators such as personal rights, level of freedom and inclusion are reported. Bratislava region with the index score of 67.9 achieved the highest social progress in Slovakia. Western Slovakia (except Bratislava region) had the index score of 60.3, followed by Central Slovakia with the score of 57.9 and finally Eastern Slovakia (index score of 56.1).

Application of EU Cohesion Policy - The Case of Slovakia

Cohesion Policy plays a key role in reducing regional disparities, helping less developed EU regions to catch up with the more developed ones, and overall promoting economic, social, and territorial convergence (European Commission). To achieve these goals, 404 billion EUR were allocated during the programming period 2014-2020 (Cohesion Open Data Platform).

Our further analysis primarily clarifies the application of EU cohesion policy in the case of the V4 countries, with a special focusing on Slovakia. Based on the Cohesion Platform, the amount of EU financial resources for the Visegrad Group was 160.75 billion EUR. The most EU resources were allocated to Poland (91.27 bil. EUR), followed by Hungary (27.16 bil. EUR) and Czechia (25.78 bil. EUR). As shown in Table 1, the value of EU funds in the mentioned V3 countries is higher than the EU average (19.29 bil. EUR). Slovakia had the fewest EU financial resources during the programming period 2014-2020, allocation in the amount of 16.57 bil. EUR.

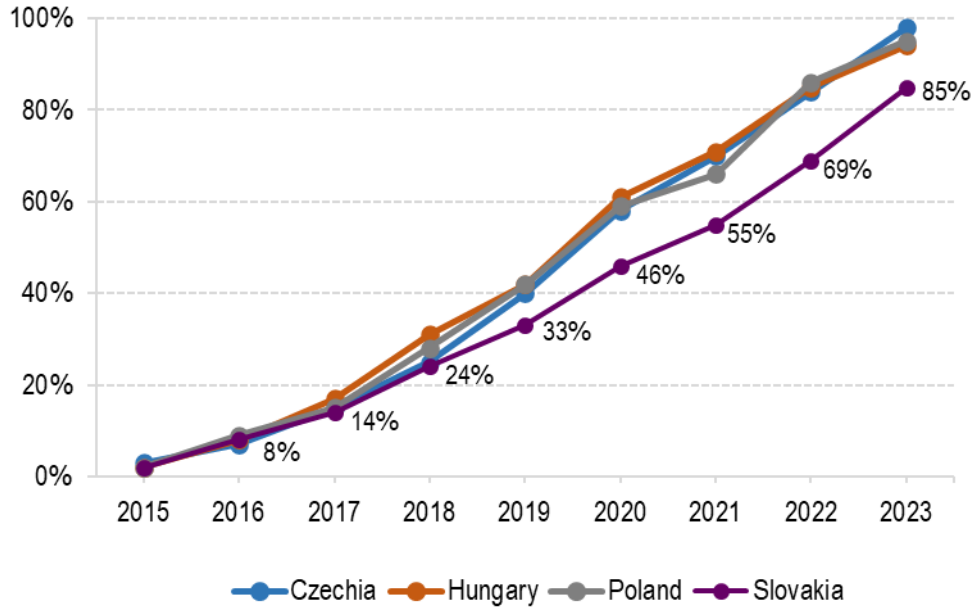
Table 1. *Allocation of Resources in V4 Countries, Period 2014-2020*

Country	Total allocation	EU resources		Country's Resources	
Slovakia	20.52 bil. €	16.57 bil. €	*80.7 %*	3.95 bil. €	*19.3 %*
Hungary	32.09 bil. €	27.16 bil. €	*84.6 %*	4.93 bil. €	*15.4 %*
Czechia	34.90 bil. €	25.78 bil. €	*73.9 %*	9.12 bil. €	*26.1 %*
Poland	111.44 bil. €	91.27 bil. €	*81.9 %*	20.17 bil. €	*18.1 %*
V4 average	49.74 bil. €	40.20 bil. €	*80.8 %*	9.54 bil. €	*19.2 %*
EU27 average	**25.91 bil. €**	**19.29 bil. €**	***74.4 %***	**6.62 bil. €**	***25.6 %***

Source: Cohesion Open Data Platform, Author's calculations.

Figure 4 demonstrates cumulative EU payments (to the end of each year) in the V4 countries during the period 2015-2023. It should be noted that the displayed values represent the values approved by the European Commission without taking into account eventual delays with the bank transfer (Cohesion Open Data Platform). The percentage consumption of the total available EU funds is different. In 2015, all V4 countries started with approximately the same rate of EU resource utilization, which was around 2 percent. However, the situation has changed to the disadvantage of Slovakia, where we observe gradual lagging behind. After 2018, the imaginary scissors affected by effective allocation and implementation began to open.

Figure 4. *Cohesion Policy EU Payments in the V4 Countries, 2015 - 2023*

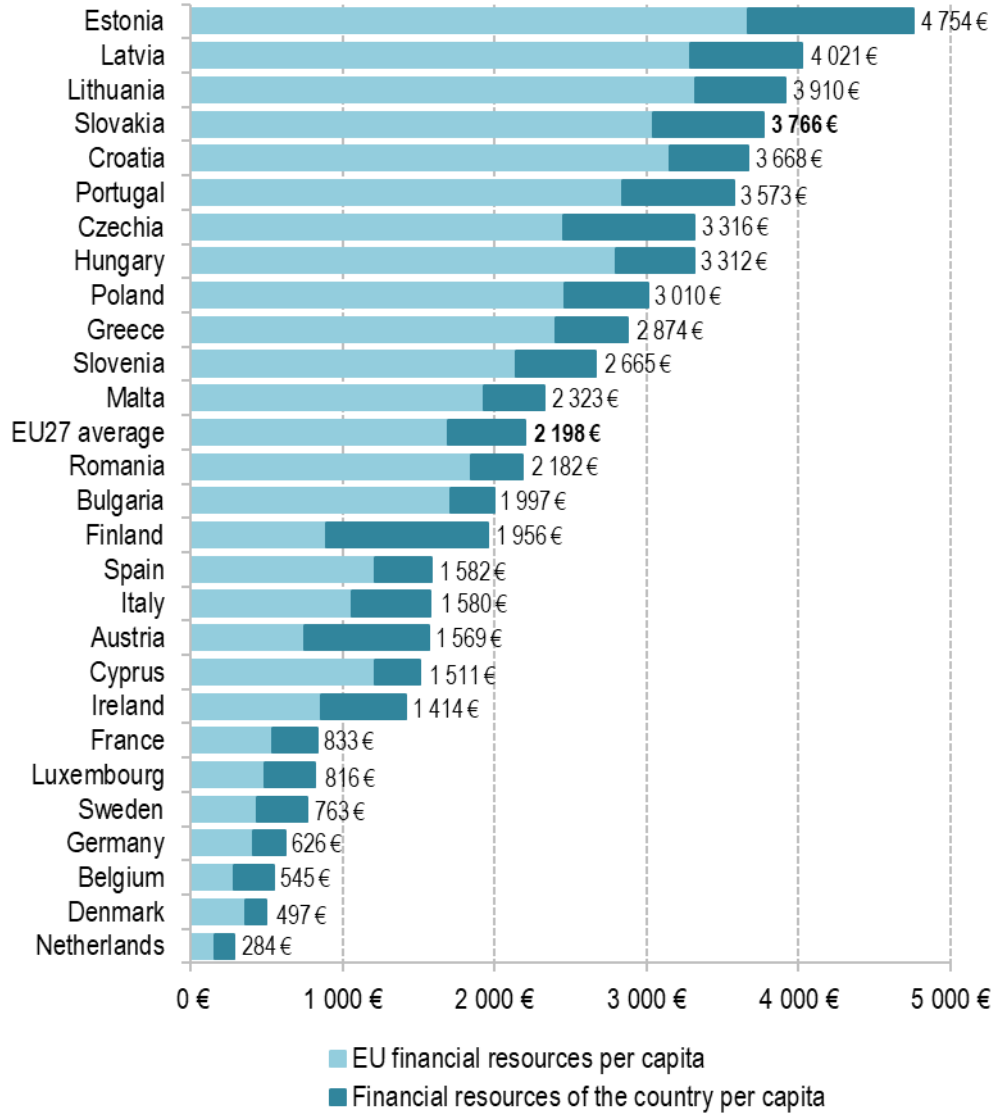


Source: Cohesion Open Data Platform, Author's calculations.

As shown in Figure 4, Slovakia has a long-term problem with drawing allocated EU financial resources. At the end of 2020, Slovakia drew 46% from EU funds for the 2014-2020 programming period (16.57 billion EUR). In the last

examined period, the drawdown increased to the level of 85%, which is significantly lower than in the other V4 countries (Cohesion Open Data Platform). This Central European country is not able to make sufficient use of the opportunities arising from its membership in the EU. (Slovakia joined the EU in 2004.) Due to the influence of a poorly set implementation system, Slovakia permanently lost some resources. The programming period was, for example, marked by questionable redistribution of funding to science and research. In Slovakia, drawing was partially suspended, and part of the allocation was reduced through the so-called decommitment. Suspension of payments by the EU, as a reaction to irregularities in fulfilling some priorities was not an isolated event. Finally, such interventions resulted in lagging behind other V4 countries. In addition, various measures during the pandemic limited the possibility of problem-free drawing of EU funds.

Figure 5. *Allocation of Financial Resources per capita for the Period 2014-2020*



Source: Eurostat, Cohesion Open Data Platform, Author's calculations.

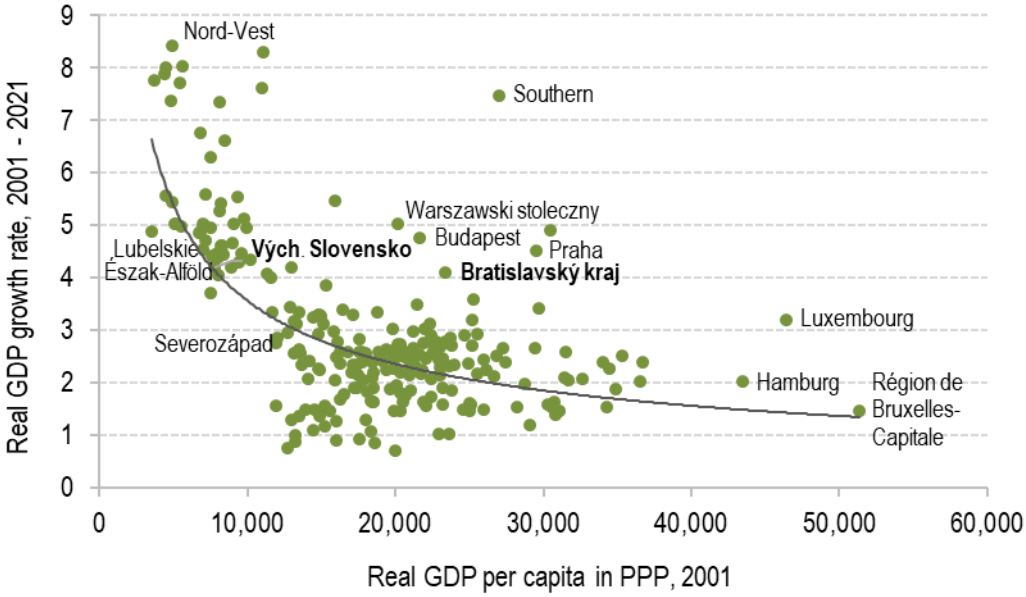
Figure 5 shows recalculated financial resources per inhabitant for the entire period of 2014-2020. It is needed to distinguish between EU financial resources and the country's own resources. EU resources typically account for 80% of all financial resources in each country. From the figure, we can conclude that the EU27 average allocation is at the level 2,198 EUR. Estonia has the highest allocation of resources per capita (4,754 EUR). On the other hand, the Netherlands shows the lowest allocation of resources per capita, only 284 EUR. The difference between these countries is up to 4,470 EUR.

Let's look at the V4 countries individually. Slovakia has the highest total allocation per capita among the V4 countries. With a value of 3,766 EUR, Slovakia took fourth place in our overall ranking. The second place from Visegrad Group belongs to the Czechia with a value of 3,316 EUR, followed by Hungary (3,312 EUR) and Poland with the lowest level 3,010 EUR. An interesting fact is that Poland and Hungary are efficient in the implementation of EU resources. Slovakia has gaps in this and should improve its processes.

In the following part, we will focus on empirical findings regarding the ongoing convergence of the V4 countries. Convergence refers the process of bringing the country's economic level closer to that of a developed country, or a group of developed countries within an integration group. According to the European Central Bank, convergence is a long-term process that brings about a sustained increase in real GDP per capita in lower-income countries towards the levels shown by higher-income countries (ECB, 2022).

The process of convergence of selected EU regions over the last twenty years can be seen on the figure below. Figure 6 shows the development of real GDP per capita in 242 EU regions at the NUTS2 level in relation to the average GDP growth rate during the period 2001 to 2021.

Figure 6. *Ongoing Convergence Process (GDP per capita in PPP, NUTS2)*



Source: Eurostat, Author's calculations.
Note: To reference countries' regions: https://ec.europa.eu/eurostat/web/nuts.

In the period 2001-2021, the real GDP per capita for 242 EU regions was at the level of 18,462 EUR and the economic growth rate was 2.99%. It can be stated that the economic development of European regions is uneven. There are also differences in living standards between developed and less developed regions. The most developed EU regions include: Luxembourg (in 2021 GDP level per capita 87,100 EUR), Région de Bruxelles-Capitale (66,200 EUR), as well as the Hamburg (61,900 EUR). The mentioned regions are located on the right of the figure, their growth rate was 2.22%, which is lower than the EU27 average for the given period.

In the long-term, we can identify the process of convergence of less developed regions. European regions with a low initial level of GDP per capita are characterized by significant economic development. This fact is confirmed, for example, by the Romanian region Nord-Vest, which increased its standard of living from 4,900 to 22,600 EUR, with the highest average growth of 8.42%. The regions of the new EU member countries had higher rates of economic growth than the regions of the founding EU countries.

Our empirical findings refer to neoclassical growth theories, specifically the application of the Solow growth model. The conclusions of this model show that the higher growth rate is mainly due to the catch-up effect, since the newly joined EU countries started from a lower level of real GDP per capita. Convergence in the long run occurs when countries with lower income levels grow faster than countries with higher income levels (Mankiw, 2022). In this case, we are talking about the absolute convergence, which describes the dependence of economic growth and the value of GDP per capita.

In the observed period, the Visegrad Group as a whole reached a level of GDP per capita of 10,819 EUR and an average growth rate of 4.48%. Within the individual V4 regions, we can see the process of catching up with the standard of living of developed countries in Western Europe. Despite the existing convergence, disparities persist not only between V4 countries, but also within each country. The highest rate of economic growth (4.96%) was reported by the Polish regions, while their average level of GDP per capita was the lowest among the V4 countries, a value of only 8,788 EUR. The remaining countries are below the average growth rate of the Visegrad Group. Hungary had a GDP per capita of EUR 10,475 EUR and a growth rate of 4.35% was the second highest. The following are the regions of Slovakia, which grew by 4.26% over twenty years, while their GDP per capita was 12,250 EUR. The most developed regions were the regions of the Czechia, where the average GDP per capita was 14,763 EUR and the growth rate 3.70%. Nowadays, the Czechia is the only V4 country with 5 transitional regions. In general, transitional regions are regions whose GDP per capita falls between 75 and 90 percent of the EU average.[7]

[7]Reg. 2021/1060 of the European Parliament and of the Council.

Conclusions

The aim of the paper was to point out the current disparities in the socio-economic development of the EU27 regions. We primarily focused on the economic development of the Visegrad Group over the last twenty years.

Our empirical findings confirmed that significant regional disparities persist between EU countries. More than two-thirds of EU regions at the NUTS2 level achieve a lower standard of living than the European average. The least developed areas are located in Southern Europe, Central and Eastern Europe. Our analysis further reveals that 94 regions report a standard of living equal to or higher than the EU27 average. The most developed regions of the EU are located in Austria, Germany, the Benelux countries, southern Ireland and Scandinavia. High positions in the current ranking were also recorded by metropolitan EU regions.

The main hypothesis, that Slovakia has a long-term problem with drawing allocated EU financial resources, was confirmed, but it requires further in-depth analysis.

Specifically, Slovakia is undergoing a process of convergence with the developed countries of the EU, but with persistent regional disparities. In 2022, Bratislava is the most developed Slovak region. The regions of western (except the Bratislava region), central and eastern Slovakia are considered less developed regions of Europe, because their performance does not reach 75% of the European average. According to our analysis, it would be appropriate to reevaluate the implementation of regional development support in Slovakia. Public policies should be aimed at optimizing the allocation of EU financial resources and increasing the efficiency of their use. Our recommendation is an individual approach to the economic development of Slovak regions. Foreign practice further confirms that the involvement of local authorities contributes to better management.

EU Cohesion Policy for the coming years should be based on the territorial principle (place-based approach). Investments in infrastructure, employment and economic growth, together with the implementation of structural reforms, should consider the needs of individual regions. The EU's intention is that all European regions and cities become actors of sustainable development and cohesion. An important element for sustainability will be the green and digital transformation of economies aimed at increasing efficiency and climate neutrality. Current challenges and ambitious goals of the EU should be included in the discussions on establishing the rules for cohesion policy beyond 2027.

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