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Artificial Intelligence and Sustainable Development: Reducing Food Waste, Building Resilient Organisations, and Enhancing Public Financial Administration

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Abstract: *This paper explores the transformative impact of Artificial Intelligence (AI) across three critical areas: food waste reduction, organisational resilience, and public financial administration. By utilising AI technologies like machine learning, predictive analytics, and real-time monitoring, the study highlights how AI can address inefficiencies, enhance systemic resilience, and support global sustainability goals, including the United Nations SDGs. In food waste reduction, AI improves demand forecasting, inventory management, and supply chain optimisation, reducing surplus and spoilage. Examples like bakery demand forecasting and blockchain transparency demonstrate economic and environmental benefits. For organisational resilience, AI enables risk assessment and adaptive strategies, strengthening supply chains and helping organisations transition from reactive to proactive approaches during crises such as COVID-19. In public financial administration, AI streamlines processes, detects fraud, and enhances public trust through innovative platforms and predictive fiscal modelling, as shown in case studies from Finland, Australia, and China. Despite its potential, AI adoption faces challenges, including costs, data integration, ethical concerns, and unequal access. Overcoming these requires robust policies, collaboration, and capacity building. This research emphasises AI's role as a catalyst for systemic change, advocating for ethical and inclusive adoption to advance sustainability, resilience, and equity in a complex world.*

Keywords: *artificial intelligence; sustainability; food waste; resilience; financial administration; digital transformation; SDG.*

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1. Introduction

Artificial Intelligence (AI) has rapidly emerged as a transformative force, reshaping industries and addressing some of the most pressing global challenges. As a suite of technologies capable of simulating human intelligence through processes like learning, reasoning, and self-correction, AI is uniquely positioned to provide innovative solutions in diverse fields. Its applications extend far beyond traditional uses, now encompassing critical areas such as sustainable development, organisational resilience, and public financial administration. The integration of AI in these domains has profound implications for achieving societal goals, particularly in the context of global challenges like climate change, food insecurity, and economic inequality.

The urgency of reducing food waste—one of the primary contributors to environmental degradation and global food insecurity—highlights the need for innovative interventions. Globally, approximately one-third of food produced is wasted, resulting in severe environmental, economic, and social consequences (Semeria et al., 2024). AI-powered systems offer unprecedented precision in addressing these issues through advanced inventory management, demand forecasting, and resource optimisation. By leveraging AI to minimise inefficiencies in food retail, stakeholders can align operations with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (responsible consumption and production) and SDG 13 (climate action).

Simultaneously, AI plays a critical role in fostering organisational resilience, especially in the face of growing uncertainty caused by pandemics, geopolitical upheavals, and climate-induced disruptions. As global supply chains become increasingly complex and interdependent, traditional risk management strategies are proving insufficient. AI's capabilities in real-time data analysis, predictive analytics, and adaptive decision-making empower organisations to not only respond to crises but also to anticipate and mitigate potential disruptions (Zamani et al., 2022). This adaptive capacity strengthens supply chain continuity and enables businesses to thrive in dynamic and volatile environments.

Public financial administration is another sector where AI is catalysing transformative change. Tax systems, often plagued by inefficiencies, fraud, and limited transparency, are being modernised through AI-driven solutions. By automating repetitive tasks, detecting fraud (OECD, 2024), and improving taxpayer engagement, AI enhances the efficiency and accountability of public financial management. These advancements not only streamline revenue collection but also build public trust in governmental institutions. AI's ability to integrate sustainability principles into public administration further aligns fiscal policies with long-term developmental goals, ensuring economic stability and equitable resource distribution.

This study explores the complex contributions of AI across these domains, presenting a comprehensive analysis of its potential to drive sustainability, resilience, and governance. The motivation for this research stems from the pressing need to address inefficiencies and risks within critical systems while harnessing AI's ability to create scalable, adaptive, and sustainable solutions. By focusing on real-world case studies and evidence-based approaches, the study demonstrates how AI's innovative capabilities can address complex challenges, optimise processes, and unlock new opportunities for progress. Through a detailed examination of AI's applications in reducing food waste, strengthening organisational resilience, and modernising public financial systems, this research underscores the need for strategic deployment of AI to foster a more sustainable and resilient future. As the global community continues to grapple with interconnected crises, AI's potential to catalyse meaningful change positions it as an essential tool for building a more adaptive and equitable world.

2. Materials and Methods

This study employs a qualitative research approach to examine the transformative role of AI in sustainable development, organisational resilience, and public financial administration. The methodology follows a structured process designed to ensure a robust analysis of the subject matter

while addressing the rationale for case study selection and the inherent limitations of this qualitative approach.

2.1. Research Design and Scope

The research is exploratory and seeks to understand how AI applications address specific challenges in three critical domains:

- Food Waste Reduction: Investigating how AI enhances efficiency in food retail systems.
- Organisational Resilience: Exploring AI's contributions to supply chain adaptability and recovery strategies.
- Public Financial Administration: Analysing the integration of AI in modernising tax systems and improving transparency.

The study adopts a case study methodology as its primary approach, focusing on documented real-world implementations of AI. The case study method is well-suited for this research because it enables a detailed examination of complex phenomena within their specific contexts, providing rich, contextual insights.

2.2. Rationale for Case Study Selection

The selection of case studies was guided by several criteria to enhance the findings' validity and generalisability:

- Relevance to Research Objectives: Case studies were chosen to align with the research's focus on sustainable development, resilience, and governance. For instance, the inclusion of AI applications in food retail (e.g., demand forecasting tools like Foodforecast) highlights direct contributions to sustainability goals.
- Diversity of Contexts: To ensure broad applicability, the cases represent various industries (e.g., retail, automotive, and public administration) and geographical regions (e.g., Europe, Asia, and Australia). This diversity allows for the identification of common success factors and challenges that transcend specific sectors or locales.
- Evidence of Impact: The selected cases demonstrate measurable outcomes, such as reduced food waste, enhanced supply chain resilience, or improved tax compliance. These tangible results provide credibility and allow for a nuanced analysis of AI's transformative potential.
- Scalability and Transferability: Preference was given to cases with clear potential for scalability and applicability to other contexts. For example, AI-driven tax compliance systems implemented in Finland and Australia serve as models for other countries aiming to modernise fiscal management.

2.3. Data Collection

A comprehensive review of existing literature was undertaken, utilising academic articles, industry white papers, and government reports. Searches were conducted using key terms like "AI in food retail," "AI for supply chain resilience," and "AI in tax administration." Sources included databases like Scopus, Google Scholar, and institutional reports to ensure credibility and relevance.

The study relies heavily on case studies to explore the practical applications of AI. Cases were selected to reflect diverse industries and geographical contexts. Each case study was analysed for its objectives, implementation process, and outcomes, with attention to scalability and alignment with sustainability goals.

2.4. Analytical Framework

The study employs thematic analysis to extract key themes and patterns from the literature and case studies. This approach allows for an in-depth understanding of: how AI addresses specific challenges within each domain, the strategies and tools enabling successful AI implementation, barriers to adoption, and areas for improvement.

2.5. Addressing Limitations

While qualitative research offers deep insights, it is subject to certain limitations, which are acknowledged in this study:

- Generalisability: The case study method may limit the ability to generalise findings to all contexts. However, by selecting diverse cases and emphasising transferable lessons, the study mitigates this limitation.
- Subjectivity: Interpretations of qualitative data are inherently subjective. To address this, the study relies on triangulation, using multiple data sources to validate findings.
- Scope of Data: The reliance on documented cases may exclude emerging AI applications that lack extensive reporting. Future research should address this by incorporating primary data collection through interviews or field observations.

2.6. Synthesis and Recommendations

The findings from the case studies were compared to identify common success factors and domain-specific challenges. This comparison highlighted how AI innovations can be adapted across sectors to achieve broader sustainability goals. The study synthesises findings into actionable recommendations for stakeholders, focusing on: enhancing the adoption of AI technologies, addressing barriers such as data accuracy and stakeholder collaboration, and promoting awareness of AI's potential to drive sustainability and resilience.

By focusing on qualitative analysis and leveraging case studies, this methodology provides rich, contextual insights into the ways AI contributes to reducing food waste, strengthening organisational resilience, and modernising public financial administration. This approach highlights AI's practical impact while offering a roadmap for future implementations in these critical sectors.

3. Food Waste Reduction: How AI technologies address inefficiencies in food retail systems

Food waste remains a critical issue that poses significant challenges to sustainable development across environmental, economic, and social domains. Globally, approximately one-third of all food produced is wasted, creating barriers to achieving the Zero Hunger Sustainable Development Goal (SDG) (Semeria et al., 2024). The environmental consequences of food waste are profound, as it contributes to greenhouse gas emissions, depletes natural resources, and pollutes water systems. This further complicates efforts to meet SDG 12.3 and SDG 13, which emphasise sustainable consumption patterns and climate action (Ewen & Dima, 2024). Economically, food waste imposes substantial costs on consumers and businesses, particularly in retail and food service industries, while socially, it exacerbates disparities in food security, limiting access for vulnerable populations. Reducing food waste is thus essential for addressing inequality, improving public health, and alleviating poverty.

Despite heightened awareness of food waste, the complexity of modern food supply chains and the involvement of diverse stakeholders present considerable challenges to achieving a 50% reduction by 2030, as outlined by the United Nations (Ewen & Dima, 2024). Achieving this ambitious goal demands innovative approaches, cross-sectoral collaboration, and the adoption of advanced technological solutions.

Innovation is vital to a company's success, as it allows for continuous adaptation to evolving business environments, legal requirements, and consumer demands. This is why modern technologies such as automated inventory tracking (Quayside Wholesale, 2023), are becoming increasingly integrated into the operations of food retailers.

Experts suggest that technology has significantly contributed to the current global challenges, with the industrial revolution accelerating the depletion of natural resources and energy, while also causing widespread pollution of air, water, and soil (Kania & Spilka, 2006). Since 1991, there has been a push towards adopting technologies that consume less water, energy, and raw materials while minimising waste. Adjustments to production methods have been proposed to

reduce harmful substances, such as heavy metals in paints, and to recycle waste materials rather than discard them (Cramer & Zegveld, 1991).

Today, we see continuous advancements in technologies designed to curb food waste, both generally and within food retail stores. Examples include innovations in digital agriculture like smart packaging, Blockchain, and RFID labels, all of which help monitor and trace contamination risks throughout the food supply chain. Other emerging technologies, such as "cascading use", "biological drying," and "joint management of food and wastewater," also aim to reduce food waste and enhance the sustainability of food retailers. Mobile platforms are crucial in promoting responsible consumption by helping users manage their food access. Through these platforms, individuals are encouraged to reduce food waste by efficiently distributing excess products. This fosters a more sustainable society, empowering people to make informed and mindful choices regarding their food consumption (Cane & Parra, 2020).

New technologies are critical in helping food retailers prevent food waste. Tools like the Internet of Things (IoT) and data analytics improve inventory management and reduce losses from product expiration by enabling real-time stock tracking. This allows food retailers to take an active role in minimising food waste and promoting a more sustainable approach to retail. Digital technologies, in particular, aid in organising waste prevention efforts, monitoring key variables, and finding synergies with other waste reduction initiatives. Furthermore, computer vision and artificial intelligence can revolutionise shelf management, making it easier to identify and restock items and detect improperly placed products. This advanced system uses cutting-edge detection technologies to spot missing items and gaps on shelves, along with barcode-matching algorithms to locate misplaced products. By adopting these technologies, food retailers can strengthen their competitive edge, enhance the customer shopping experience, and significantly reduce food waste.

Implementing these technological solutions not only gives retailers a competitive advantage but also streamlines internal processes, enabling them to respond swiftly to customer demands and anticipate changes in consumer preferences. These technologies boost supply chain and inventory efficiency, while also allowing stores to offer personalised product recommendations by leveraging advanced data analytics and AI to understand customer behaviour. This leads to a more enjoyable and tailored shopping experience. Additionally, precise monitoring of stock levels and expiration dates ensures food waste reduction, contributing both to environmental sustainability and operational cost savings. Embracing these technologies reshapes not only how food retailers operate but also how they engage with customers, further solidifying their standing in the market.

The implementation of new technologies in food retail to combat food waste brings numerous benefits. These innovations allow retailers to minimise food loss while simultaneously boosting profits (Corsini et al., 2023). Technologies also support waste prevention by enabling retailers to sell products nearing their expiration date at discounted prices. Digital technologies, in particular, are crucial in advancing food waste prevention efforts. They offer vital tools for identifying, tracking, and managing supply chain processes more efficiently. When strategically applied, these innovations lead to meaningful reductions in wasted or lost food (Zhang, Wedel, & Bloem, 2022). Moreover, adopting digital solutions to curb food waste presents economic advantages by lowering waste disposal costs and enhancing awareness among both employees and consumers. These technologies play a pivotal role in waste reduction strategies, offering retailers essential resources to cut losses and enhance profitability (Corsini et al., 2023). Incorporating these advanced tools opens up a variety of opportunities to optimise processes and streamline inventory management. By harnessing digital technologies and marketing insights, retailers can encourage their suppliers to adopt waste-reducing practices and influence consumers to make more sustainable purchasing and consumption choices, thereby reducing environmental impact.

The use of digital technologies not only cuts down on waste but also raises employee awareness, leading to better waste management practices. In addition, simulation tools based on historical data and machine learning techniques can assist retailers in making more informed

decisions about product ordering and pricing, further reducing waste and increasing profit margins (Zhang, Wedel, & Bloem, 2022).

AI technologies can significantly reduce food waste in retail through advanced forecasting, simulation, and decision-making frameworks. These innovations enhance operational efficiency and sustainability. Demand Forecasting Machine learning models, such as "Foodforecast," have demonstrated a 30% reduction in bakery returns by optimising sales forecasts, leading to substantial environmental benefits (Hübner et al., 2024). Integrating AI with demand forecasting and order quantity decisions can lower operational costs by approximately 6% in various retail settings. Simulation and Reinforcement Learning A simulation framework utilising reinforcement learning has shown the potential to reduce food waste by nearly $500,000 over three years while increasing profits by 42% (Pilarski, Sidhu, & Varro, 2023). Agent-Based Simulation models can analyse consumer behaviour and technology adoption, providing insights into effective food waste reduction strategies at the retail level (Anggraeni, Silaban, & Cahyadi, 2021). Comprehensive Frameworks The Cognitive Automation for Food (COGAF) framework outlines research streams for AI applications in food waste reduction, emphasising the need for a systematic approach to tackling inefficiencies in the food supply chain (Sharma, Singh, & Musunur, 2020). While AI presents promising solutions, challenges remain in data accuracy and the need for policy interventions to support technology adoption and consumer awareness in reducing food waste.

The "Foodforecast" system, a machine learning-based tool implemented in bakeries, exemplifies how AI can reduce food waste. By enhancing the accuracy of sales forecasting, the system achieved a 30% reduction in returns for bread and rolls (Hübner et al., 2024). This improvement not only minimised waste but also delivered environmental benefits that outweighed the operational costs of implementing the system. The "Foodforecast" system employs ensemble learning methodologies, incorporating predictive features such as weather data, seasonal trends, and historical sales patterns to refine demand predictions. Additionally, hybrid approaches combining exponential smoothing and ARMA models (Autoregressive Moving Average Model) have demonstrated effectiveness in addressing unique trends in bread sales, further optimising forecasting outcomes. Accurate demand forecasting is critical in supply chain efficiency as it directly influences production and inventory management. By aligning production levels with actual demand, bakeries can significantly reduce the surplus, contributing to waste reduction and increased profitability (Duarte, Gonçalves, & Santos, 2021). These findings align with broader studies emphasising the importance of forecast accuracy in enhancing supply chain performance (Avci, 2019). However, challenges persist. Maintaining forecast accuracy under varying market conditions and consumer behaviours remains a key hurdle, requiring continuous refinement of predictive models.

AI technologies have demonstrated versatility and effectiveness in addressing inefficiencies across food retail systems, proving instrumental in waste reduction through applications in demand forecasting, inventory management, and circular economy initiatives. Predictive analytics further enhance inventory management by utilising external factors such as weather patterns to anticipate demand fluctuations, minimising spoilage (Şimşek, 2024). Companies like Walmart and Coles employ AI tools to optimise inventory levels for perishable goods, ensuring stock aligns with actual demand while machine learning algorithms improve shelf-life predictions and monitor product quality, reducing spoilage risks (Kollia et al., 2021). Additionally, AI supports circular economy practices by facilitating the redistribution of surplus food, enhancing resource efficiency, and significantly mitigating waste (Onyeaka et al., 2023).

Despite its potential, AI adoption in food retail faces significant challenges, including high implementation costs and complexities in data integration. Addressing these barriers is essential for maximising AI's role in waste reduction. Future research and innovation should focus on improving model adaptability, integrating diverse data sources, and scaling solutions for broader industry adoption.

4. Organisational Resilience: The role of AI in enhancing supply chain adaptability and operational recovery

Organisational resilience is a concept that appears more and more frequently in direct relation to the success of an organisation (Duchek, 2020). Researchers have defined organisational resilience from different perspectives - social, psychological, and strategic management - showing that this concept has multiple facets (Xiao & Cao, 2017). Organisational resilience is most often seen as a capacity: "resilience is a function of an organisation's overall situation awareness, management of keystone vulnerabilities, and adaptive capacity in a complex, dynamic, and interconnected environment" (McManus et al., 2008), or "organisational resilience as an organisation's ability to anticipate, respond, adapt, and recover from a disruptive event" (Matos et al., 2022). When it comes to defining supply chain resilience, this is seen as "the capacity of a supply chain to persist, adapt, or transform in the face of change" (Wieland & Durach, 2021). Ponomarov and Holcomb, cited by Zamani et al., define supply chain resilience as "the adaptive capability of the supply chain to prepare for unexpected events, respond to disruption, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structures and function" (Zamani et al., 2022).

AI plays a pivotal role in the fast development of the tech industry and is "the mimicking of human intellect using computers" (Onyeaka et al., 2023). Considering the evolution of AI, including deep learning, machine learning, and image identification, it is safe to say that these technologies will become an important influence (Onyeaka, et al., 2023). At the same time, AI can bring resilience to companies, given its attributes, such as (1) predictive analytics for proactive decision-making, (2) automated customer service, (3) supply chain optimisation, (4) risk assessment and mitigation and (5) enhancing remote work (De Marco, 2023). AI improves resilience by enabling predictive analytics, which allows organisations to anticipate potential issues and proactively mitigate risks. For instance, AI-driven tools can forecast supply chain disruptions, optimise resource allocation, and streamline communication processes during crises. AI enhances real-time monitoring and decision-making, particularly valuable in disaster response, where rapid data analysis can support emergency services and recovery efforts. At the same time it supports mitigating risk associated with excessive inventory or insufficient inventory (Attah et al., 2024). AI's capacity to adapt and learn from past disruptions empowers organisations to develop more robust systems and policies, reinforcing their ability to withstand and recover from future challenges (Rane, Choudhary, & Rane, 2024). When it comes to supply chain resilience, AI facilitates the optimisation of transportation routes, and reduces delivery times, with overall improvement over supply chain resilience. During a crisis, speed and accuracy of decisions are crucial, and here is where using AI represents leverage, as according to literature, AI foresees supply chain disruptions by analysing market trends and political developments, giving organisations the data needed so that they can adjust strategies proactively (Rane, Choudhary, & Rane, 2024).

The primary scope of supply chain resilience (SCR) is to enable a supply chain to recover rapidly from disruptions and enhance the original performance capabilities of the supply chain (Naz et al., 2022). Similar to organisational resilience, supply chain resilience is measured before the disruption, during the response, and post-disruption, but in the light of disruptions such COVID-19, a new concept of adaptive resilience outbrakes, claiming that a complex supply chain cannot sustain a state of equilibrium (Belhadi et al., 2021). In a study conducted by Zamani et al. (2022), supply chain resilience is linked with four phases of the organisational resilience: readiness, response, recovery, and adaptability strategies. In the initial phase, of readiness, AI facilitates predictive analytics, enabling companies to anticipate disruptions by monitoring early warning signals and making informed forecasts (Zamani et al., 2022). This capability allows organisations to prepare strategies before disruptions occur. During the response phase, AI supports real-time data processing, enabling firms to coordinate effectively with partners and adapt to volatile demand

patterns, which was especially vital during the COVID-19 pandemic when misinformation impacted consumer behaviour (Zamani et al., 2022). AI also plays a vital role in the recovery phase by accelerating the recovery of supply chain operations, so that organisations immediately reintegrate fragmented elements and reduce negative impact. Finally, in the adaptation phase, AI helps organisations implement lesson learnings from past disruptions, which enhances their future resilience. By fostering innovation, improving information quality, and enabling effective decision-making, AI empowers organisations to build robust, adaptable supply chains that are better equipped to withstand future disruptions (Zamani et al., 2022).

The field of research on supply chain resilience is still underdeveloped (Belhadi et al., 2021), and the concept of supply chain resilience is less mature (Negri et al., 2021) but overall, the researchers agree that supply chain resilience has a significant role to reduce or avoid supply chain risks and disruptions, in a timely manner and cost-effectively, hence the interest on this topic (Zhao et al., 2022). According to the findings of Negri et al. (2021), supply chain resilience lacks empirical research, being studied mostly theoretically.

Supply chain resilience is in close relation with supply chain risk and risk management concepts (Negri et al., 2021), but traditional risk management approaches are not fully scalable to the complex and dynamic nature of supply chains, and this is where resilience is proposed as a remedy to deal with supply chain disruptions. Events such as COVID-19 pandemic or the war in Ukraine, known in the literature as "black swan" events, are not on the list of anticipated risk sources and these can cause significant harm to supply chains (Wieland & Durach, 2021). These have created the context where supply chain resilience became a need (Naz et al., 2022). In the food supply chain, AI enables real-time decision-making and process optimisation, and retailers are now in a good position to reduce food waste (Onyeaka et al., 2023).

In the actual context, there is a high demand for organisations to be sustainable, resilient, and adaptable. Generative AI is a very useful and powerful tool for enhancing resilience and competitiveness in this present dynamic economy (Shore et al., 2024). Integrating AI can (1) boost supply chain resilience, by enabling transparency, followed by (2) effective decision-making that is enabled by all generated data insights, (3) improve supply chain responsiveness due to faster information sharing across the supply chain, and (4) a faster recovery through AI planning, coordination, and control (Thorsson & Razanica, 2024). Five AI capabilities contribute to supply chain resilience, according to Modgil et al., as cited by Thorsson & Razanica (2024): transparency, personalised solutions, procurement strategy, reduced disruption impact, and last-mile delivery.

A study was conducted in the automotive and pharmaceutical industries with the purpose of understanding how these companies have implemented AI or possible AI implementation to increase supply chain resilience. The conclusion is that both companies utilise AI to "identify potential risks and opportunities through big data analysis, enabling early alerts and proactive measures to address uncertainties promptly" (Thorsson & Razanica, 2024). Also, AI is used for forecasting and predictive data analytics, with the end purpose of predicting potential risks and opportunities (Thorsson & Razanica, 2024). The automotive company uses AI for contract reading, and this is an area currently considered for future implementation by the pharmaceutical company. In conclusion, AI currently facilitates supply chain resilience in both companies in these areas (Thorsson & Razanica, 2024). Both companies see significant potential in using AI to enhance supply chain resilience by enabling visibility across sthe upply chain, which will lead to faster decision-making processes. There is alignment between both industries when it comes to using AI to enhance supply chain resilience during and after disruption, concluding that proactive strategies are preferred instead of reactive ones (Thorsson & Razanica, 2024).

Companies such as Walmart, Tyson Foods, Koch Industries, Maersk, Siemens, and Unilever are using AI to plan for and adapt to supply-chain disruptions. For example, Unilever uses an AI application to find alternative supply sources on short notice, while Maersk and Walmart use AI to automate negotiations (Van Hoek & Lacity, 2023).

5. Public Financial Administration: The integration of AI to modernise tax systems and enhance transparency

This research provides information on how tax administrations are using AI as an appropriate method to reform tax procedures by increasing the efficiency and transparency of the tax system, developing solutions and best practices based on the collected factual information, robotising repetitive tax tasks, enhancing the fight against tax evasion, collecting and processing tax information for administrative purposes, and providing new types of tax assistance and services to taxpayers. As tax administrations are currently at different stages in the use of digital systems, the research team's objective is to present the current level of implementation of AI in various tax systems and to stimulate a responsible use of digital tools in line with respecting and protecting taxpayers' rights. In the fight against tax evasion, contemporary tax administrations cannot give up efficiency and transparency.

The economy can be boosted and people's well-being improved by generating an increasing flow of business transactions between companies and third parties, leading to a greater ability for governments to obtain financial guarantees. Taxation is one of the sectors that need to align with the requirements of the digital age to increase the efficiency of the economy and the welfare of the population. According to the Organisation for Economic Co-operation and Development (OECD), accelerated technological advancement, digitisation, and new business models have led to constant change and harmonisation of tax units (OECD, 2017).

As one of the main fund-generating structures for the state, the tax authorities must always be able to respond to any future changes and challenges.

In this context, tax administrations play a key role in ensuring the proper collection and management of public money, while promoting a system of governance based on transparency and accountability. Digitisation and the integration of sustainability principles in these institutions is an essential step in the modernisation and streamlining of tax administration at the level of each European country.

The digital age in the field of fiscal administration involves the use of IT&C technologies in order to perform specific tasks and missions faster and more efficiently (Clarke, 2019). Thus, the digitalisation of tax administration agencies involves activities to modernise processes and improve procedures using digital equipment, tools, systems and technologies, including various mobile applications, electronic platforms, etc, e-government networks, e-learning programs, or other computerised systems. The use of technology based on AI allows to reduce spending and the processing time of documentation, avoids bureaucratic formalities, and increases the level of trust of citizens in services provided by state agencies (Pires, 2024). Interest in integrating sustainability principles into tax administrations appears in the context of sustainability as a key element in how to use public resources and in ensuring the development of sustainable prospects for future generations (Svetlozarova Nikolova, 2023).

European tax administrative institutions must take responsibility for promoting and adopting the principles of sustainability in all aspects of their work. This requires the establishment of legal rules and an institutional framework that emphasises decision-making transparency, the limitation of resource consumption, and responsible management in the field of waste and pollution. In the literature, it is mentioned that between efficiency and sustainability, there is a harmonious connection, resulting in the adoption of a strategy based on eco-efficiency (Caiado et al., 2017) so that the organisation interested in sustainable development, while ensuring a high level of efficiency, will be able to use AI in current activities to initiate the process of eco-efficiency. Through AI, tax administration can reap considerable benefits. This process can increase contributor compliance due to the incorporation of information technology and communication (ICT) within the tax oversight and verification process (Djafri et al., 2023). For example: applications such as electronic tax services, chatbots, and biometric identification systems allow a simplification of the procedures for registration, declaration, and payment of tax, tax, this makes it easier for taxpayers to comply with tax legislation. In addition, both competent authorities and

entrepreneurs can use artificial intelligence systems to monitor in detail the results of entrepreneurial activity or to report or detect cases of tax evasion.

AI)= could revolutionise tax administration by increasing efficiency, better collection and management of tax receivables, and fighting tax fraud and evasion. Numerous studies have examined the applicability of AI to the tax administration system and its effects on various aspects of the tax regime.

Zhang (2023) proposes the development of a tax infrastructure based on AI for environmental protection, so as to increase the collection of tax liabilities, improve tax payment services, and develop a system of supervision and control of tax levies. Capitalising on the advantages of AI technology, tax authorities have the possibility to optimise the tax system and increase the efficiency of public services responsible for tax administration. All this can lead to increased tax collection and can lead to combating the phenomenon of tax evasion. According to other research, advanced digitalisation of the communication process within tax authorities was found as a result of the use of AI technology (Ihnatišinová, 2021).

AI technology allows for the development of new electronic communication channels, which allow for a more efficient fiscal administration, without the use of paper. Thus, it can simplify the dialogue between taxpayers and tax authorities, which leads to faster and more accurate processing of tax information.

At the same time, by integrating AI technology in tax risk management, an intelligent taxation system with advanced functions can be set up and developed (Huang & Zhang, 2022). Tax authorities can analyse large volumes of data using AI algorithms to detect potential anomalies and other tax risks. This helps to identify obvious cases of tax evasion and strengthen tax compliance.

Another study presents an intelligent tax planning system that is based exclusively on an analysis of current realities and formulates a new intelligent algorithm for the fiscal forecast's elaboration, which is, based on an advanced big data system combined with an AI strategy. This concept supports the business environment to conduct judicious tax planning in accordance with the legal provisions, thus reducing the personnel costs of companies and increasing the earnings obtained in the sector of self-employment. In addition, the AI industry can help ensure macroeconomic stability and stimulate sustainable economic growth. Reforms of the tax administration, which also include the integration and use of artificial intelligence, can remedy issues related to low tax collection or corruption in the fiscal administrative apparatus (Herbert, Nwarogu, & Nwabueze, 2018).

However, the implementation of such technologies involves certain challenges that need to be addressed. These include insufficient administrative capacity and a low level of responsibility. In the same vein, detecting, preventing, and combating the risks of tax fraud and corruption are indispensable for effective tax administration. These phenomena significantly affect the economy, public authorities, and implicitly society as a whole (Ceva & Ferretti, 2021).

In the tax literature (Dmytrenko & Anastasiia, 2024) a number of techniques are presented through which a tax professional could effectively use AI tools.

Analysis, data processing, and identification of fraud patterns: AI can analyse a high volume of financial information in order to identify trends, anomalies, and characteristics that could indicate possible tax-exempt opportunities or potential issues related to non-compliance.

Indication of tax adjustments and deductions: A.I.-based information systems can facilitate the classification of transactions into appropriate tax categories and identify any deductions for which a company may or may not be eligible. Presumptive analytics: AI can estimate future tax contributions and financial results based on a data history, allowing for strategic financial planning.

Document verification: AI can easily examine the tax documentation completeness and correctness, as well as identify possible irregularities, reducing the time and risk of human error.

Fraud detection and risk management: Applications dedicated to artificial intelligence-based tax audits have the ability to identify any suspicious activity or likely mismatches

that indicate tax fraud or evasion and can assess the risk factors associated with various schemes of tax evasion.

Technological and social advances of a fulminating magnitude following the fourth industrial revolution involve a number of important changes in tax administration structures. It is imperative to reconfigure the entire activity given the harmonisation and integration requirements in the current digitised society.

As a result, the development and implementation of AI-based mechanisms are essential to minimise the risks associated with tax fraud. To properly capitalise on the potential of AI in the field of tax administration, benchmarking is recommended, meaning that, the experience and good practices of other tax administrations or institutions with similar tasks in other countries will be analysed. The following section presents a documentary study based on the work of the Tax Administration of Finland (VERO SKATT) and other examples of successful implementation in the tax administration processes of AI technologies.

An analysis of the activities of the period 2021-2022, presented in sustainability reports, the organisation is working to improve its work by implementing digital tools and using AI. Next we detail how AI and dedicated computer applications were used and the results obtained, related to the specifics of the activity, in order to increase the quality of services offered to citizens.

A. Conducting information campaigns in digital format.

The concept of „Happy Taxpayer" was created in 2021, through a website similar to a network of «streaming»,, by which users have the possibility to inform themselves about the expenses made with the money coming from their taxes, by displaying images and messages similar to some movies. This new concept has obtained very good feedback on an international scale as well (VERO SKATT, 2021). In 2022, the tax administration in collaboration with 6 influencers from social networks presented how public money is used, for example: through the provision of maternity assistance packages, for example, free advice and guidance. These videos were watched about 600,000 times on influencers' social networks and the institution's channels (VERO SKATT, 2022).

B. Provision of electronic services to citizens.

Telephone support, according to the continuous monitoring of customer satisfaction with the institution's telephone support service in 2021, taxpayers rated 90% of calls as good quality or excellent, and 93% of cases were resolved or initiated. These results come from an approximation based on approximately 110,000 conversations. In the case of the Tax chat service, the percentage recorded was 45% (good or excellent) and 51% (solved or initiated). Evaluations were collected for about 100,000 chat situations. It is assessed that the difference in satisfaction between telephone and chat support is explained in particular by the fact that chat support is anonymised and therefore, the resolution of certain cases is not always carried out. (VERO SKATT, 2021). The creation and operationalisation of an online fee payment transaction platform in close cooperation with citizens have led to a considerable increase in voluntary compliance. Taxation without paper and the creation of electronic services are a solution for sustainable development, the tax administration is determined to reduce the amount of paper used and increase the level of skills in the digital field of employees. Representatives of the authority say that without the use of digital systems, they would have permanently needed about 2,000 extra employees annually. Consequently, the additional costs would have been higher by at least 110 million euros per year (VERO SKATT, 2022).

C. Electronic information exchange and international cooperation.

Cross-border collaboration has also taken the form of the exchange of information on tax fraud through electronic platforms. This way of collaboration contributes to the achievement of joint control actions, to the promotion of tax fairness at an international level, as well as to the avoidance of double taxation through the correct collection of tax taxes. A digital platform for Nordic citizens with income or assets in a Scandinavian country other than their country of residence has been developed to support citizens of the Nordic countries (VERO SKATT, 2021).

D. Artificial intelligence to ensure tax revenue.

The activity of forecasting tax revenues within the tax administration service is carried out with the help of AIe and aims to generate information on the factors of change and the fiscal risks that influence the operations. With the help of the information obtained, one can anticipate manifestations and changes that may affect the collection of taxes, thus justifying the subsequent tax receipts. During 2022, there was a decrease in the number of tax audits, but the amounts collected increased. Moreover, tax inspectors had the time to address several control topics or simplified guidance procedures, which allows them to reduce working time and make work more efficient (VERO SKATT, 2022)

E. Using digital tools for employee well-being.

A wide range of professional development opportunities are made available for the well-being of staff through various online activities and training courses. Staff work in modern workspaces equipped with versatile technological equipment that can be used at all times. They also have the opportunity to work from home because they are electronically connected to the applications needed to carry out their work. Routine tasks have been considerably reduced thanks to the use of digital tools, so tax inspectors can develop laborious analyses and assessments in various tax cases (VERO SKATT, 2022).

Summarising the above, it follows that the Finnish tax administration service has implemented concrete measures to strengthen and improve sustainable capacity through the implementation of AI. Organisational strategy is largely part of a sustainable and digitalised future. Thus, developing the digital system, facilitates the proper fiscal behaviour of taxpayers, which can prevent the implementation of corrective measures. At the same time, interinstitutional cooperation is carried out with celerity, ensuring institutional efficiency. As a consequence, the implementation and use of AI also contribute to reducing the impact of the daily activity of the organisation on the natural environment.

In Malta, the government has put in place the digital system whereby tax authorities are alerted if the income of a contributor is not consistent with the size of the assets that the latter has in the patrimony (Zammit, 2023). This is an excellent model to combat tax fraud and money laundering.

According to Australian tax authorities, they identified unpaid tax bills worth more than 530 million dollars and managed to prevent fraudulent tax refund claims amounting to $2.5 billion, due to the implementation of artificial intelligence programs.

With the help of AI and blockchain, China has reformed the central tax collection and tax administration processes (Min & Yanting, 2018).

In a similar way, the Russian Federation has resorted to AI applied in the field of taxation in order to discover situations of tax evasion and to facilitate compliance with tax legislation. Each country can develop a coherent strategy for AI in its own tax administration sector, studying successful approaches and adapting them.

6. Addressing the Risks and Challenges of AI Adoption

While AI has immense potential to transform industries and drive innovation, its adoption also presents significant risks that need careful analysis. Among these, algorithmic bias and unequal access to technology stand out as critical challenges. Left unaddressed, these issues could exacerbate inequalities and erode trust in AI systems, underscoring the necessity for ethical and equitable implementation practices.

Algorithmic bias occurs when AI systems produce unfair outcomes due to prejudiced training data or flawed decision-making processes. This phenomenon has led to discriminatory practices in sectors such as finance and healthcare, where marginalised groups often bear the brunt of these biases. For example, biased loan approval algorithms have resulted in systemic exclusion of minority communities, while similar issues in healthcare have hindered equitable access to

treatment (Pasipamire & Muroyiwa, 2024). Such outcomes not only perpetuate existing disparities but also diminish public confidence in AI technologies. Moreover, in regions like Africa, where systemic inequalities are already pronounced, algorithmic bias can act as a barrier to leveraging AI for economic development (Pasipamire & Muroyiwa, 2024). Addressing this issue requires a multifaceted approach, including regular bias audits, inclusive data collection to ensure diverse representation, and the implementation of transparent, explainable algorithms that foster accountability and trust.

Another pressing challenge is the unequal access to AI technologies, which underscores the broader digital divide between affluent and under-resourced communities. AI's integration often necessitates advanced infrastructure and digital literacy, resources that are unevenly distributed across populations. This disparity hinders equitable participation in critical areas such as education, healthcare, and employment, further marginalising low-income groups. For instance, AI-driven education tools may enhance learning outcomes for students with access to high-speed internet and modern devices, while excluding those without these basic resources (Farahani & Ghasemi, 2024). Similarly, the use of AI in telemedicine can improve healthcare delivery in urban areas but may leave rural populations underserved. To mitigate these inequities, governments and organisations must invest in expanding digital infrastructure, subsidising access for underserved communities, and fostering community engagement to tailor AI solutions to specific local needs. Developers must also prioritise inclusivity and accessibility in designing AI systems to ensure they cater to a diverse user base (Mihaila & Mihăilă, 2024).

Effective governance and ethical practices play a pivotal role in mitigating these risks. Policymakers, industry leaders, and researchers must collaborate to create robust frameworks that address fairness, transparency, and inclusivity. Embedding ethical considerations into AI systems from their inception ensures that equitable outcomes are prioritised. Transparent auditing mechanisms help maintain accountability while fostering trust among users. Initiatives that encourage public participation in AI development further enhance its acceptance and relevance across diverse demographics.

In conclusion, while AI offers transformative benefits, these must be balanced against the potential risks of algorithmic bias and unequal access. By adopting inclusive policies, promoting ethical development, and investing in equitable infrastructure, stakeholders can harness AI's capabilities to foster progress without deepening existing inequalities. Responsible governance and proactive mitigation strategies are essential to ensure that AI serves as a tool for sustainable and equitable growth, benefiting society as a whole.

7. Conclusions

This study underscores the transformative potential of AI across three critical domains: food waste reduction, organisational resilience, and public financial administration. Through innovative applications, AI has emerged as a cornerstone for advancing sustainability, enhancing adaptability, and modernising governance systems, aligning closely with the goals outlined in the United Nations' Sustainable Development Goals (SDGs).

In the food retail sector, AI technologies have provided revolutionary tools to tackle inefficiencies, with notable impacts on minimising food waste. Advanced demand forecasting, inventory management, and predictive analytics allow retailers to align supply with demand, reducing surplus and spoilage. For instance, AI systems like *Foodforecast* have demonstrated reductions in bakery returns by as much as 30%, showcasing their environmental and economic benefits. Additional technologies, such as Blockchain and Internet of Things (IoT) sensors, further enhance transparency and traceability within supply chains, empowering retailers to optimise stock levels, reduce losses, and meet sustainability objectives. Moreover, the integration of AI into circular economy initiatives facilitates food redistribution and resource efficiency, contributing to environmental and societal well-being. While implementation challenges, including high costs and data integration complexities, persist, the long-term gains for environmental sustainability,

operational savings, and customer satisfaction make these technologies indispensable for the future of food systems.

Organisational resilience, particularly within supply chains, has similarly benefited from AI's ability to enable proactive and adaptive strategies. AI-powered tools such as predictive analytics and real-time monitoring systems allow organisations to foresee potential disruptions, streamline operations, and recover swiftly from crises. These tools have proven invaluable during global challenges like the COVID-19 pandemic, where supply chain adaptability was critical in responding to fluctuating demand and logistical bottlenecks. The concept of adaptive resilience, supported by AI, has redefined how organisations prepare for and respond to disruptions, ensuring operational continuity and enhanced competitiveness. Furthermore, AI's ability to foster transparency, optimise transportation routes, and support informed decision-making positions it as a vital enabler of resilient and sustainable supply chains. The evidence from sectors like automotive and pharmaceuticals highlights how AI is already empowering organisations to proactively manage risks, reduce the impact of disruptions, and maintain robust operational frameworks.

In public financial administration, AI represents a paradigm shift in how tax systems are managed and modernised. By leveraging automation, machine learning, and big data analytics, AI enhances efficiency, combats fraud, and ensures greater transparency in tax administration. Examples from Finland, Australia, and China illustrate the transformative impact of AI on revenue collection and compliance monitoring. AI systems not only simplify taxpayer interactions through tools like chatbots and digital platforms but also enable tax authorities to detect anomalies and potential fraud with greater precision. These improvements foster trust in governmental institutions while reducing administrative costs and optimising resource allocation. Notably, Finland's implementation of AI in forecasting tax revenues and reducing paperwork has demonstrated significant cost savings and operational efficiencies. Such advancements underscore the importance of incorporating AI into public administration as a means to promote sustainable economic growth, enhance transparency, and ensure the fair distribution of resources.

However, the successful integration of AI across these domains requires addressing key challenges. Data integration, stakeholder collaboration, and equitable access to AI technologies remain pressing issues. Policymakers and industry leaders must also focus on ethical considerations, ensuring that AI systems are designed and deployed to promote inclusivity, fairness, and environmental responsibility. Strengthening regulatory frameworks, fostering cross-sector partnerships, and investing in capacity-building initiatives will be crucial in unlocking AI's full potential.

In conclusion, the study highlights AI's capacity to revolutionise the domains of food waste management, organisational resilience, and public financial administration. The findings illustrate that AI not only offers practical solutions to pressing challenges but also serves as a catalyst for broader systemic change. By leveraging AI, stakeholders can drive significant progress toward achieving sustainability, enhancing resilience, and modernising governance in an increasingly complex and interconnected world. As technology continues to evolve, a strategic and inclusive approach to AI adoption will be essential for maximising its benefits and addressing the multifaceted challenges of the 21st century.

References

Anggraeni, M.C., Silaban, C. A., & Cahyadi, E. (2021). Role of artificial intelligence in the management of food waste. *IEEE Proceedings*

Avci, B. (2019). A study to examine the importance of forecast accuracy to supply chain performance: A case study at a company from the FMCG industry. *Journal of Operations Management, 27*(2), 124–136. http://dx.doi.org/10.13140/RG.2.2.16814.95048

Attah, R. U., Garba, B. M. P., Gil-Ozoudeh, I., & Iwuanyanwu, O. (2024). Enhancing supply chain resilience through artificial intelligence: Analyzing problem-solving approaches in logistics

management. *International Journal of Management & Entrepreneurship Research, 6*(12), 3883-3901. https://doi.org/10.51594/ijmer.v6i12.1745.

Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2021). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: An empirical investigation. *Annals of Operations Research, 333.* Springer. https://doi.org/10.1007/s10479-021-03956-x.

Caiado, R. G. G., Dias, R. F., Mattos, L. V., Quelhas, O. L. G., & Filho, W. L. (2017). Towards sustainable development through the perspective of eco-efficiency: A systematic literature review. *Journal of Cleaner Production, 165.* https://doi.org/10.1016/j.jclepro.2017.07.166.

Cane, M., & Parra, C. (2020). Digital platforms: Mapping the territory of new technologies to fight food waste. *British Food Journal.* http://dx.doi.org/10.1108/BFJ-06-2019-0391

Ceva, E., & Ferretti, M. P. (2021). Political corruption: The internal enemy of public institutions. *Oxford University Press.* http://dx.doi.org/10.1093/oso/9780197567869.001.0001

Clarke, A. (2019). Digital government units: What are they, and what do they mean for digital era public management renewal? *International Public Management Journal, 23*(3), 358–379. https://doi.org/10.1080/10967494.2019.1686447.

Corsini, F., Annesi, N., Annunziata, E., & Frey, M. (2023). Exploring success factors in food waste prevention initiatives of retailers: The critical role of digital technologies. *British Food Journal*. http://dx.doi.org/10.1108/BFJ-01-2023-0034

Cramer, J., & Zegveld, W. C. L. (1991). The future role of technology in environmental management. *Futures.* https://doi.org/10.1016/0016-3287(91)90095-J

De Marco, N. (2023, September 29). Council post: Building resilient organizations with AI. Forbes. https://www.forbes.com/councils/forbestechcouncil/2023/09/29/building-resilient-organizations-with-ai/

Djafri, I. A., Damawati, I., Suharto, S., Satwika, I. G. A. R. P., & Rahmatullah, R. (2023). Utilization of information and communication technology in the tax administration system to increase taxpayer compliance. *Ilomata International Journal of Tax and Accounting, 4*(1), 14–25. https://doi.org/10.52728/ijtc.v4i1.670

Dmytrenko, A., & Anastasiia, L. (2024). Ways to improve accounting, auditing, and taxation of business entities in the context of implementing European management practices and introducing artificial intelligence into accounting. *Науковий журнал «Економіка і регіон».*

Duchek, S. (2020). Organizational resilience: A capability-based conceptualization. *Business Reserch, 13,* 215–246. https://doi.org/10.1007/s40685-019-0085-7.

Duarte, A., Gonçalves, A. M. M., & Santos, L. O. (2021). Optimal production policies in bakery units. *International Journal of Production Research, 59*(5), 1428–1445. http://dx.doi.org/10.3390/pr9010101

Ewen, C. D., T., & Dima, F. K. (2024). Impact of food waste on society, specifically at retail and foodservice levels in developed and developing countries. *Foods.* https://doi.org/10.3390/foods13132098.

Farahani, M.S. & Ghasemi, G. (2024). Artificial Intelligence and Inequality: Challenges and Opportunities. *Qeios.* https://doi.org/10.32388/7HWUZ2

Herbert, W. E., Nwarogu, I. A., & Nwabueze, C. C. (2018). Tax reforms and Nigeria's economic stability. *International Journal of Applied Economics, Finance and Accounting, 3*(2), 74-87. http://dx.doi.org/10.33094/8.2017.2018.32.74.87

Huang, W., & Zhang, J. (2022). Artificial intelligence technology and tax risk management innovation. *SPIE Proceedings.* https://doi.org/10.1117/12.2641091.

Hübner, C., Riesenegger, M., Haselbeck, J., & Moser, R. (2024). Advances in demand forecasting for bakeries. *Retail AI Applications Quarterly, 12*(1), 34–47. https://doi.org/10.1111/jiec.13528

Hubner, N., Caspers, J., Coroamă, V.C., & Finkbeiner, M. (2024). Machine-learning-based demand forecasting against food waste: Life cycle environmental impacts and benefits of a bakery case study. *Journal of Industrial Ecology.* https://doi.org/10.1111/jiec.13528.

Ihnatišinová, D. (2021). *Digitalization of tax administration communication under the effect of global megatrends of the digital age*. SHS Web of Conferences, 92, 02022. https://doi.org/10.1051/shsconf/20219202022

Kania, A., & Spilka, M. (2006). Optimization as an alternative in search of sustainable technological processes. *Journal of Achievements in Material and Manufacturing Engineering.* https://www.researchgate.net/publication/42107458_Optimization_as_an_alternative_in_search_of_sustainable_technological_processes

Kollia, A., Nikolaou, E., Karampela, I., Manesis, S., & Chrysafides, S. (2021). Machine learning for shelf life prediction. *Food Quality Management Journal, 18*(3), 57–72.

Matos, F.M.C., Monteiro, M., Rosa, Á. and Campino, J. (2022). Organizational Resilience Factors of Startups: Exploratory Case Study, *European Conference on Management Leadership and Governance*, *18*(1), pp.291–299. https://doi.org/10.34190/ecmlg.18.1.724.

McManus, S., Seville, E., Vargo, J., & Brunsdon D. (2008). Facilitated process for improving organizational resilience, *Natural Hazards Review*, *9*(2), pp. 81–90. https://doi.org/10.1061/(asce)1527-6988(2008)9:2(81).

Min, W., & Yanting, C. (2018). The challenges and countermeasures of tax collection and administration in China under the background of "Internet+". *Fifth International Conference on Public Management.* https://doi.org/10.2991/icpm-18.2018.19

Mihaila, C.O. & Mihăilă, M. (2024). Artificial Intelligence - The Era of Social Inequalities. In Regulating the Future, We Need to Look at the Risks. *Conference: 4th International Conference on FinTech, Cyberspace and Artificial Intelligence Law.* http://dx.doi.org/10.62768/ADJURIS/2024/1/03

Naz, F., Kumar, A., Majumdar, A., & Agrawal, R. (2022). Is artificial intelligence an enabler of supply chain resiliency post-COVID-19? An exploratory state-of-the-art review for future research. *Operations Management Research, 15.* https://doi.org/10.1007/s12063-021-00208-w.

Negri, M., Cagno, E., Colicchia, C., & Sarkis, J. (2021). Integrating Sustainability and Resilience in the Supply chain: a Systematic Literature Review and a Research Agenda. *Business Strategy and the Environment*, *30*(7). https://onlinelibrary.wiley.com/doi/abs/10.1002/bse.2776.

OECD. (2017). Tax administration 2017: Comparative information on OECD and other advanced and emerging economies. *OECD Publishing.* https://www.oecd.org/content/dam/oecd/en/publications/reports/2017/09/tax-administration-2017_g1g7dd34/tax_admin-2017-en.pdf

OECD. (2024). Using Artificial Intelligence in Public Financial Management. *OECD Publishing.* https://one.oecd.org/document/GOV/SBO%282024%2914/en/pdf

Onyeaka, H., Tamasiga, P., Nwauzoma, U. M., Miri, T., & Juliet, U. C. (2023). AI in circular economy practices. *Sustainability in Food Systems, 20*(7), 95–112.

Pasipamire, N. & Muroyiwa, A. (2024). Navigating algorithm bias in AI: ensuring fairness and trust in Africa. *Frontiers in Research Metrics and Analytics.* https://doi.org/10.3389/frma.2024.1486600

Pires, M. (2024). Artificial intelligence (AI) in the field of tax administration. *Review of International and European Economic Law, 3*(5). https://www.rieel.com/index.php/rieel/article/view/90

Pilarski, S., Sidhu, A., & Varro, D. (2023). A simulation environment for reducing food waste via reinforcement learning. 2023 Annual Modeling And Simulation Conference, ANNSIM, 332–344. Retrieved from https://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-196959 .

Quayside Wholesale. (2023). The Impact of Technology on the Food Retail Industry. Wholesale Food Blog - Quayside Wholesale. https://quaysidewholesale.co.uk/blog/the-impact-of-technology-on-the-food-retail-industry/

Rane, N., Choudhary, S., & Rane, J. (2024). Artificial intelligence for enhancing resilience. *Journal of Applied Artificial Intelligence, 5*(2). https://doi.org/10.48185/jaai.v5i2.1053.

Semeria, F., Falchetta, G., Vinca, A., Laio, F., Ridolfi, L., & Tuninetti, M. (2024). Food loss & waste of staple crop products: Mapping environmental impacts within the nexus paradigm. *EGU General Assembly 2024.*https://doi.org/10.5194/egusphere-egu24-16795.

Sharma, A., Singh, P.V., & Musunur, L.P.. (2020). Artificial intelligence and robotics for reducing waste in the food supply chain: Systematic literature review, theoretical framework, and research agenda. OSF Preprints. https://doi.org/10.31219/osf.io/h3jgb.

Shore, A., Tiwari, M., Tandon, P., & Foropon, C. (2024). Building entrepreneurial resilience during crisis using generative AI: An empirical study on SMEs. T*echnovation*, 135, 103063–103063. https://doi.org/10.1016/j.technovation.2024.103063.

Svetlozarova Nikolova, B. (2023). Design of Sustainable Tax System. In *Tax Audit and Taxation int he Paradigm of Sustainable Development: The Impact on Economic, Social and Environmental Development* (pp. 75-97). Cham: Springer Nature Switzerland. https://www.researchgate.net/publication/371827222_Design_of_Sustainable_Tax_System

Şimşek, A. (2024). Predictive analytics for reducing spoilage.*Food Retail Tech Journal, 15*(6), 82–91. https://www.therail.media/stories/2024/10/17/predictive-analytics-for-reducing-food-waste-in-restaurant-supply-chains

Thorsson, E., & Razanica, S. (2024). Navigating Disruptions: A Multiple Case Study on the Role of AI in Enhancing Supply Chain Resilience, https://gupea.ub.gu.se/bitstream/handle/2077/82113/IBT%20202423.pdf?sequence=1&isAllowed=y

Van Hoek, R., & Lacity, M. (2023). How global companies use AI to prevent supply chain disruptions. *Harvard Business Review.* https://hbr.org/2023/11/how-global-companies-use-ai-to-prevent-supply-chain-disruptions.

VERO SKATT. (2021).*Verohallinnon vuosi 2021.* https://www.vero.fi/tietoa-verohallinnosta/verohallinnon_esittely/verohallinnon-vuosi/vuosikertomusarkisto/verohallinnon-vuosi-2021/

VERO SKATT. (2022).*Verohallinnon vuosi 2022. https://www.vero.fi/tietoa-verohallinnosta/verohallinnon_esittely/verohallinnon-vuosi/vuosikertomusarkisto/verohallinnon-vuosi-2022/*

Wieland, A., & Durach, C. F. (2021). Two perspectives on supply chain resilience. *Journal of Business Logistics*, 42(3). https://doi.org/10.1111/jbl.12271

Xiao, L., & Cao, H. (2017). Organizational Resilience: The Theoretical Model and Research Implication. *ITM Web of Conferences*, 12, 04021. https://doi.org/10.1051/itmconf/20171204021.

Zammit, C. (2023). New AI-powered software to be deployed to catch tax cheats.*Times of Malta. https://timesofmalta.com/article/finance-ministry-deploy-aipowered-software-catch-tax-cheats.1030430*

Zamani, E. D., Smyth, C., Gupta, S., & Dennehy, D. (2022). Artificial intelligence and big data analytics for supply chain resilience: a systematic literature review. *Annals of Operations Research*, 327(2). https://doi.org/10.1007/s10479-022-04983-y.

Zhang, J., Wedel, M., Bloem, M.W. (2022). Mitigating Food Waste in the Retail Supply Chain: Marketing Solutions. *Journal of sustainable marketing.* http://dx.doi.org/10.51300/jsm-2022-59

Zhang, J. (2023). *Optimization of the environmental protection tax system design based on artificial intelligence*. Frontiers in Environmental Science, 10. https://doi.org/10.3389/fenvs.2022.1076158.

Zhao, G., Liu, S., Wang, Y., Lopez, C., Zubairu, N., Chen, X., Xie, X., & Zhang, J. (2022). Modelling enablers for building agri-food supply chain resilience: insights from a comparative analysis of Argentina and France. *Production Planning & Control*, 1–25. https://doi.org/10.1080/09537287.2022.2078246