
INTERNATIONAL JOURNAL OF ADVANCED LEGAL RESEARCH

**THE IMPACT OF ARTIFICIAL INTELLIGENCE ON TAXATION:
OPPORTUNITIES, CHALLENGES, AND FUTURE DIRECTIONS**- Nidhi Bhatt¹**ABSTRACT:**

Artificial Intelligence (AI) is revolutionizing various industries, and taxation is no exception. This paper explores the implications of AI on tax systems, including both opportunities and challenges. AI technologies such as machine learning, natural language processing, and data analytics are increasingly being integrated into tax administration processes, leading to enhanced efficiency, accuracy, and compliance. AI-driven tools facilitate tax planning, risk assessment, fraud detection, and enforcement, thereby improving revenue collection and reducing tax evasion. However, the adoption of AI in taxation also raises concerns regarding data privacy, algorithmic bias, and job displacement. Moreover, the complexity of AI systems poses challenges for tax policymakers and administrators in ensuring transparency, accountability, and fairness. This paper discusses key considerations for leveraging AI in tax administration, including the need for regulatory frameworks, ethical guidelines, and capacity building. It concludes by outlining future directions for research and policy development to harness the full potential of AI while mitigating its risks in the realm of taxation.

I. INTRODUCTION

This dissertation offers a study of the issues that reside at the junction of tax law and government regulatory Artificial Intelligence (thusforth referred to as "AI").In the first place, it will discuss how artificial intelligence is reorganising the value chain and will call into question conventional tax legal notions. Second, it will delve into the existing applications of artificial intelligence in the sphere of tax law compliance and enforcement.

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In the process of providing mapping of current research topics, there are numerous added values. To begin, an understanding of artificial intelligence is necessary for both research fields, whether they are concerned with AI-powered business models or with the application of AI in taxation. We believe that such information is a crucial precondition for accurately interpreting the socio-technical and economic events that are impacting the established legal system, as well as for determining whether and how standards may and should adapt and possibly change. The second point is that the legal examination of artificial intelligence in the field of taxation should not just focus on the influence of AI on the existing legal framework. In contrast, it is of equal significance to examine the possibilities of utilising artificial intelligence in order to improve the efficiency and fairness of the taxation system, as well as to provide increased enforcement capabilities. Thirdly, the possibility of utilising artificial intelligence technology to automate specific duties and procedures within the compliance and tax enforcement system calls for a thorough legal study, in which tax practitioners and tax attorneys should take the lead role. Issues that could potentially arise from the employment of artificial intelligence in taxation systems can only be fully recognised and addressed within the technology itself if a knowledge base of the law is present. The structure of the paper is as follows. In the data-driven economy, Section 2 provides some insights on the extent to which classic terms of tax law, such as taxable person, taxable event, and taxnexus, are appropriate to capture the changing methods in which businesses create value and ensure that equitable taxation is implemented. Afterwards, Section 3 examines artificial intelligence technologies as potential instruments that can enhance the efficiency of voluntary tax compliance and tax law enforcement, and it underlines the legal problems that are associated with these facets.

Tax law for Artificial Intelligence

New ways of creating value are constantly being brought to light as a result of advances in knowledge and technical innovation. Over the course of the past two centuries, the utilisation of coal and steam engines, as well as the utilisation of internal combustion engines, electricity, and oil, had a substantial and revolutionary impact on the economic models. In more recent times, the rise of big data, artificial intelligence, and automation has had a profound impact on the structure of the value chain, thereby converting the existing ownership-based industrial society into a service-driven information society.

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Technologies are becoming increasingly mainstream and pervasive in the current economic climate. When it comes to commercial operations, they are no longer only tools; rather, they develop new forms of value that can be transported from one location to another with remarkable speed and ease, and they produce new markets. The usage of digital networks, whose economic potentialities are not limited by national boundaries, has revolutionised the market. The market is no longer a physical place where products are exchanged; rather, it is an interconnected, easy-to-access, open area without borders where data, goods, and temporary use rights can be freely transferred. On the one hand, this environment is distinguished by the synergy that exists between data and data processing technologies, which makes it possible to provide new digital services. The enormous data flows, which have been made possible by the growing number of transactions that are accomplished through the use of computers, have been incorporated into a worldwide interconnected data-processing infrastructure, which is focused on the Internet but is not restricted to it. It is possible to communicate, access data, and provide any form of private or public service over this infrastructure, which functions as a universal medium. Citizens are able to purchase, utilise banking and other services, pay taxes, receive benefits and entitlements from the government, access information and expertise, and create social connections thanks to government assistance. A citizen's access to content and services is mediated by algorithms, which are frequently powered by artificial intelligence techniques. These algorithms choose information and opportunities for the citizen while also documenting any action. The desire for data that artificial intelligence has encompasses a wide range of information, including meteorological data, environmental data, and data pertaining to industrial activities.

On the other side, the digital economy distinguishes itself by the rising utilisation of robotics. It is possible to define robotics as "artificial intelligence in action in the physical world," which is sometimes referred to as "embodied AI." To be more specific, a robot is a physical machine that is required to deal with the dynamics, uncertainties, and complexity of the physical world. Integration of perception, reasoning, action, and learning skills, in addition to the capability to communicate with other systems, is typically included in the control architecture of the robotic system. Both the production processes and the delivery of goods and services are being altered as a result of the adoption of robotics in industry 4.0. The material handling processing procedures that robots perform not only improve the

productivity of the work, but they also manage the organisation of the activity through coordination and logistics.

These two key aspects of the new digital economy generate significant issues for tax law, the principles of which have been designed for an economic system with different characteristics. However, just as the transition from an agricultural feudal economy to an industrial society had repercussions for the tax legal systems (such as the introduction of income and consumption taxes), the introduction of digital technologies necessitates the modification of traditional tax legal concepts, if not the creation of new ones, in order to satisfy the requirements of new economic models. Additionally, we will address the impact that AI-driven business models have on three basic tax law ideas in the following paragraphs: 1) a taxable individual; 2) a taxable occurrence; and 3) a tax base.

II. TAXABLE PERSON

The automation of business processes is viewed by many as a paradigm change, the primary characteristics of which are the evolution in the application of artificial intelligence, which is anticipated to have a significant impact on production models, the new balance between labour and capital, and the organisation of work. Technology advancements in the field of artificial intelligence and robotics are having a significant impact on both the process of creating value and the way work is carried out.

A gloomy view that highlights that the application of artificial intelligence in the production chain could lead to unemployment (often known as "technological unemployment"), wage stagnation, and income inequality presents itself when confronted with this situation.² More optimistic viewpoints imply that artificial intelligence will just bring about a shift in required work skills, with the particular feature that the digital revolution will be different from those of the industrial revolution in that not only will routine cognitive functions be at risk, but also non-routine cognitive tasks.³ The transition from human labour to automation is anticipated to provide challenges to national tax systems and, as a result, to the public financing systems that are currently in place. This is due to the fact that Social Security

²According to OECD statistics, 14% of jobs are highly automatable while 32% would face substantial changes because of automation. In 2015 OECD signalled that, because of massive use of robotic equipment, multinational enterprises would reduce their manufacturing activities offshore because of lower labour costs and that they may consider moving where consumers are.

³A. Uricchio, *Intelligenza artificiale e diritto-robottax: modelli di rilievo e prospettive di riforma*, in *Giur.It.*, Issue 7, 2019.

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payments, income taxes, and payroll taxes account for a significant portion of the revenue that states get.⁴ These considerations provide the basis for utilising the fiscal policy in order to contrast the adverse effects of technological innovation on the labour market, to balance the potential loss in terms of revenue for the state, and to finance investments in education with social transfer and social expenditure measures, such as the Finnish Universal Basic Income (UBI). The fact of the matter is that taxes is one of the most effective tools for directing the behaviour of individuals and societal changes, while simultaneously increasing public income and maintaining social welfare.⁵

The EU Proposal for a Digital Service Tax

The Commission submitted a package of measures for the fair taxation of the digital economy on March 21, 2018. The package included a communication, a recommendation, and two proposals for directives, which are as follows: the first part is about the implementation of the Digital Service Tax, and the second part is about the Significant Digital Presence.⁶ In particular, the proposal for a Digital Service Tax (DST)⁷ – which was defined by the Commission itself as “provisional” - was oriented towards the enterprises and business models which significantly rely on the contribution of users in the value chain. The tax applies to income produced by the supply of specific digital services, which are essentially defined by the users' participation in the relevant activity, as mentioned clearly in the DST. Article 3, paragraph 1 lists the following as examples of such services: 1) advertising services, which involve presenting targeted advertisements on a digital interface; 2) intermediary services, which involve giving users access to a multi-sided digital interface; and 3) services for transmitting data obtained from users. Therefore, in the instance of the Digital Service Tax, the European Commission states that the identification of a new tax on the profits received from the delivery of specific digital services by taxable people (taxable transactions) was necessary due to changes in the production chain, the centrality of data, and user participation.

The tax base is the gross revenue of the enterprise received in exchange for the supply of

⁴E. Brynjolfsson and A. McAfee, *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*, W.W. Norton & Company, 2014.

⁵M. G. Lexer and L. Scarcella, *Artificial intelligence and labor markets. A critical analysis of solution models from a tax law and social security law perspective*. *Rivista italiana di informatica e diritto*, Issue 1, 2019.

⁶J. Becker and J. Englisch, *Taxing where value is created: What user involvement got to do with it?*, in *Intertax*, Volume 47, Issue 2, 2019.

⁷J. Becker and J. Englisch, *Taxing where value is created: What user involvement got to do with it?*, in *Intertax*, Volume 47, Issue 2, 2019.

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digital services, net of VAT and other comparable taxes. The tax impacts the revenue produced from the processing of user data, not the participation of the users themselves. The basic ideas and reasoning behind the EU Commission's proposal were applied to the construction of taxes like the ones that Austria, France, Italy, and the Czech Republic enacted. This is one of the first instances in which data-related transactions are regarded as taxable operations.

III. Artificial Intelligence for tax law

While many proposals have been made to modify tax laws and regulations to incorporate AI into company models, interest in AI technology has increased because of its possible uses in tax procedures.⁸ The enforcement of tax laws involves a number of tax-related tasks that are largely repetitive and time-consuming, such as data collecting, analysis, and comparison, retrieving actual and legal information, making case-based decisions, etc. In addition, taxpayers must gather information, verify documents, enter data into the tax system, prepare tax returns and accounting entries, etc. These operations can be thought of as input-output data procedures: an expert human (a tax administration employee or tax professional) makes a decision that may have some legal ramifications under tax law (pay tax/not pay tax, tax rate, legal interpretation, evasion, anomaly pattern, etc.) based on specific information (corporate ledger, transactions, contracts, assets, properties, existing rules, fact of the case, etc.). These qualities have made tax management an attractive topic for the application of AI research. Tax law was chosen as one of the fields where the first knowledge-based system applications were established as early as the 1970s. These were "expert systems," end-to-end computer programmes that functioned by utilising "knowledge bases," which are collections of specialist data pertinent to a given field, and inferential engines, or procedural algorithms, which allowed the system to solve issues related to its assignment. Taxman was the first instance of an expert system created during this initial phase. The system was designed to evaluate the effects of certain corporate reorganisation events. It could classify a given instance for corporation tax purposes by applying the full set of statutory criteria and ideas. The other programmes were Investor (1987), Taxman II (1979), Tax Advisor (1982), and Expertax (1986).

In light of this, the current part first looks at how AI is used in tax systems to support both

⁸L.T.McCarty, *ReflectionsonTAXMAN:AnexperimentinArtificialIntelligenceandlegalreasoning*, in *Harv.L.Rev.*, Volume90, Issue5, 197G.

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voluntary tax compliance and the assessment and control processes of tax administrations. Next, it examines a few legal issues to guarantee the fairness and legality of AI's application in tax systems.

a. AI for taxpayers

In tax compliance, AI applications are employed for 1) enhanced tax law cognition, 2) tax accounting, 3) tax requests and case predictions.

i. Tax law cognition

The term "legal recognition" refers to the procedures used to make the law applicable to taxable business. These days, taxpayers frequently have to deal with a complex tax law environment where it is more difficult to interpret and interpret regulations due to a number of factors, including the requirement to comply with supranational standards. In this area, artificial intelligence offers intriguing applications to improve taxpayers' access to and understanding of tax law. Companies who have to traverse the increasingly complex US Tax Code, for instance, can employ AI systems to track tax rates and computations for different tax jurisdictions. One example of such a tool is Tax Knowledge Engine (TKE), an application from Intuit Inc. that facilitates user-friendly tax preparation. The technology correlates more than 80,000 pages of US tax laws and instructions depending on each taxpayer's particular financial circumstances to provide solutions that are specific to them. The State's understanding of the potential benefits of artificial intelligence (AI) technology in enhancing taxpayers' legal knowledge is demonstrated by the deployment of such a tool.

ii. Tax accounting

AI offers interesting applications in the tax accounting industry that are quite distinct and address a wide variety of needs. AI can be used, for instance, to identify transactions that are tax-sensitive and extract important data from tax records. Based on previous classifications made by human personnel, intelligent algorithms can be utilised to discover assets that are wrongly booked in the company's accounting. The accounting department at Deloitte offers AI-powered solutions for a range of tax applications. It created a tax analytics tool that examines the employer's employee-related tax responsibilities and, by evaluating and aggregating the data, enables the business to control its tax status. The tool is pre-loaded with carefully chosen information, such as training data, business rules, and a glossary, to help the machine grasp pertinent language.

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The firm, for instance, employs natural language generators in its tax practice to offer customised financial advice.[G1]

In addition, Deloitte offers a service that involves obtaining refunds for indirect taxes like VAT or sales taxes. Deloitte uses Cognitive Tax Insight TM (CogTax) for these reasons. It analyses the entire population of accounts payable transactions using machine learning algorithms, optical character recognition (OCR), and analytics to identify overpayments and lower the possibility of future overpayments.[G2]

As in the preceding example, AI technologies can expedite procedures by automating simple jobs, but they definitely couldn't replace humans entirely, especially when it comes to complex problems. Because of this, large accounting firms in particular are investing in the use of AI technologies in both cost-effective and promotional ways.

Tax case prediction

The prediction of judicial rulings in tax problems is a recent development in the field of AI application. Applications of this kind fall under the umbrella of "predictive justice." This uses machine learning, data analytics, and natural language processing tools to examine vast volumes of court rulings and forecast how cases will turn out. The BlueJ project, which was established through a collaboration between industry and researchers, is one of these key applications in this field. The team has created an artificial intelligence programme that offers taxpayers answers to common legal questions that come up in Canadian tax tribunals. The technology may identify workers as either self-employed or employees for income tax reasons based on historical court interpretations of the law. Researchers developed a prediction algorithm that tracks patterns in case law and anticipates tax authority interpretation using the G00 cases under Canadian law.

The Italian Ministry of Research-funded research project LAILA (Legal Analytics for Italian Law) offers another illustration. The project's current focus is on applying legal analytics (LA) techniques to a wide range of legal information sources, including statutes, case law, and empirical legal data. It uses AI to deduce previously unidentified correlations and create data-driven forecasts in the realm of tax law. The research group is now working on a legal prediction on VAT tax law based on an Italian case.

b. AI for tax authorities

In addition to helping taxpayers with compliance procedures, artificial intelligence (AI) applications are helping tax authorities with a growing number of operational tasks. Tax

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agencies have begun to use AI for two purposes: (1) tax audit and fraud detection; and (2) tax payment and debt management. Tax authorities and other state actors employ other AI applications (3) to make better policy decisions.

CONCLUSION

In conclusion, the intersection of artificial intelligence (AI) and tax presents both opportunities and challenges for tax authorities, taxpayers, and policymakers alike. The integration of AI technologies into tax systems has the potential to streamline tax compliance processes, improve efficiency, reduce administrative burdens, and enhance revenue collection. AI-powered tools can automate repetitive tasks, analyze vast amounts of data, detect tax fraud and evasion, and provide valuable insights for decision-making.

In conclusion, while AI holds immense potential to transform tax administration and compliance, its implementation must be guided by principles of fairness, transparency, and inclusivity to realize its full benefits and mitigate potential risks. By striking the right balance between innovation and regulation, AI can play a pivotal role in modernizing tax systems and fostering greater efficiency, integrity, and trust in the tax ecosystem.