Competition Law in The Age of Artificial Intelligence and Machine Algorithms: An Indian Perspective

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Abstract: The exponential growth of artificial intelligence (AI) and machine learning algorithms has fundamentally altered the functioning of modern markets, particularly within digital and e-commerce ecosystems. While these technologies enhance operational efficiency, market transparency, and consumer access, they also introduce unprecedented challenges for competition law enforcement. This paper examines the impact of artificial intelligence and machine algorithms on the competition law framework in India, with specific emphasis on algorithmic price-fixing, discriminatory pricing, personalized advertising, and autonomous or tacit collusion.

The study adopts a doctrinal and analytical research methodology, analysing statutory provisions of the Competition Act, 2002, relevant case laws, and comparative international developments to evaluate the adequacy of India's existing competition regime in addressing AI-driven anti-competitive conduct. It explores how self-learning algorithms, operating without explicit human coordination, may distort market outcomes by facilitating parallel pricing behaviour, reducing consumer choice, and exploiting asymmetries in data and information. A balanced approach is essential to ensure that technological innovation promotes consumer welfare without undermining the principles of free and fair competition in India's evolving digital economy.

Keywords: Artificial Intelligence, Machine Algorithms, Competition Law, Algorithmic Collusion, Digital Markets.

INTRODUCTION

"We won't allow anti-competitive behavior in a smoke-filled room or over online utilizing complicated pricing algorithms. Physical and digital, consumers have a right to a free and fair market."[1]

Background

When it comes to purchasing goods and services, nothing is more than a few clicks away in today's digitalized world. Do consumers benefit from the tremendous rise in the use of mobile devices such as smart phones, laptops, tablets, and other computers, or does it open up the door for anti-competitive behavior? The benefits of the digital market are undeniable, but the huge amounts of data and consumer information it contains have the potential to spur anti-competitive behavior.

E-commerce platforms have also made it easier for algorithmic price-fixing to take hold. If it is the United States, the United Kingdom, France, or India, no nation is exempt from the e-commerce culture. Humans aren't involved in algorithmic price-fixing since it's done by software or a bot. Competition law is one of the most crucial areas which is also being impacted by the steady transition away from human participants to machines in several facets of daily life.

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[1] Assistant Attorney General Bill Baer, Department of Justice's Antitrust Division,

http://www.justice.gov/atr/public/press_releases/2015/313011.docx.

Concerning competition and customers, technological advancements have far-reaching effects, including the growth in digitalized market settings, the collecting of information and data, automation of rules and machine learning.[2]

Enforcing competition legislation, especially against cartels, was always a difficult task. This has gotten much more worrisome now that more sophisticated technologies have been brought into the mix. Here, prices are typically established by machines rather than people, and these machines have greater characteristics that will make them better than humans at accomplishing competitive pricing, which implies that the parties were unable to come to an agreement or a consensus. Using algorithms and artificial intelligence in the subject of competition law would be the focus of this paper.

Meanings

What is Meant by Algorithms?

Algorithms are simply the same old stuff. Because of technical progress and development, its usage has become more affordable and, as a result, nearly widespread.[3] According to the Oxford English Dictionary "algorithm" means "a process or set of rules used in calculations or other problem-solving operations".[4]

Algorithms may be used to handle a wide range of difficult issues involving data and computations. Google, which we all use for a number of search reasons, is one of the most prominent examples of an algorithm in our everyday life. Google search results are based on an algorithm. To give us with accurate results, Google makes use of algorithms to sift through the massive amounts of data that are available on its website in order to find information that is pertinent to its consumers.[5] You just need one click to achieve your goal, and algorithms are the only thing that can do it in such a short amount of time. To put it another way, we employ algorithms every time we go online to purchase or reserve a movie ticket.

What is Meant by Artificial Intelligence?

According to the English dictionary of Oxford, Artificial Intelligence means "The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages".[6] "The father of Artificial Intelligence John McCarthy was of the view that", it is "The science and engineering of making intelligent machines, especially intelligent computer programs".[7]

To put it simply, it is a kind of computer programming that allows robots to think and behave like people, and to do so autonomously, based on the current environment. Unlike other computer programmes, you don't have to provide explicit instructions for every action you do here.[8] The intelligence that machines possess is derived from sophisticated algorithms, and they behave autonomously as a result.

Research Problem

Algorithm price-fixing has been made easier to use because of the advent of e-commerce platforms. Humans aren't involved in algorithmic price-fixing since it's done with the assistance of software or a robot. Computers are gradually replacing humans in many parts of daily life, and competition law is taking notice. There are far-reaching consequences when technological advancements are studied in connection to the nature and features of competition between players and their interactions with customers.[9] It was never that easy for the competition enforcement authorities, especially cartels since everything occurs under the dark shadow. But today as more clever robots have entered the picture; the problem has gotten more frightening. In this setting, prices are frequently determined by machines rather than by humans. These computers comprehend excellent traits that make them better than humans at achieving competitive pricing, and they can do so without communicating with each other, implying that there really is no contract between the buyer, no confluence of minds, and no agreement of will.

Literature Review

The invention and improvement of intelligent, self-learning algorithms to assist in pricing decision-

[2] A. Ezrachi and M. E. Stucke, *Virtual Competition* 94 (Harvard University Press, 2016)

[3] Alyonazakurdaeva, the future of the algorithm economy and its benefits for the technological companies, Yalantis, *available at* https://yalantis.com/blog/the-future-of-the-algorithm-economy/. (Last visited on June 11, 2022)

[4] Oxford dictionary, Indian edition, (2007).

[5] Tristan Greene, A beginner's guide to AI: Algorithms, THE NEXT WEB (Aug. 3, 2018), *available at* https://thenextweb.com/artificial-intelligence/2018/08/02/a-beginners-guide-to-ai-algorithms/.(last visited on 21 May 2022)

[6] Oxford dictionary, Indian edition,(2007).

[7] Tutorials Point,https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_tutorial. pdf.

[8] Tristan Greene, A beginner's guide to AI: Algorithms, The Next Web Aug. 3, 2018, *available at* https://thenextweb.com/artificial-intelligence/2018/08/02/a-beginners-guide-to-ai-algorithms/..(Last visited on Jan 28, 2022)

[9] A. Ezrachi and M. E. Stucke, *Virtual Competition* 94 (Harvard University Press, 2016)

making and other market tactics have recently seen ground-breaking research and progress (Ezrachi and Stucke.

2016).[10] Algorithms play truly a key function in determining. They are designed in such a way that they only reveal the necessary facts to the user, regardless of what information they represent for the customers. In reality, it is the algorithm that offers the direction to our searches (Gillespie, 2013). Personal data is generated when we use any of these digital gadgets such as Amazon or Google, which allows these corporations to create targeted marketing strategies that limit customers to a few possibilities. On the other side, corporations like Amazon, whose survival is built on public and consumer data, believe that transparency in regards to their actions would not deliver big benefits by being more secretive in terms of exposing their information to the public (George Packer, 2014). [11]

Algorithms and AI working together may cause problems for the interests of customers. Automated data analysis is now possible because of the advancements in artificial intelligence over the last several years. Data analysis is no longer taught step-by-step; instead, it has evolved into an automated and self-learning system that can read the minds of consumers and respond to their needs in real-time (Dirk Helbing, Bruno S. Frey, Gerd Gigerenzer, Ernst Hafen, 2017).[12] In addition to this, there is a more sophisticated and serious competitiveness issue.

As human beings, anti-competitive agreements are seen by all competition authorities. If a company's executives, directors, managers, etc. engage in an agreement with another company, the company is held accountable. Until recently, people have been replaced by machines to get to any kind of accord or understanding. As a result of their ability to self-collude, machines have transformed the landscape of competition law. When it comes to this, the competition authorities have no idea what to do since it goes beyond established definitions and practices of cooperation (Ezrachi and Stucke, 2015). [13]

Research Methodology
The present study is descriptive and analytical. The doctrinal research conducted hereinafter has enunciated the systematization and interpretation of the procedural and substantiate provisions of the

statutes relating to the Competition Law and Artificial Intelligence framework. Doctrinal research is carried out by arranging, ordering and analysis of the legal structure, legal framework and case laws to search out the new thing by extensive surveying of legal literature. Therefore, an effort has been made to address the legal issue with a new output by carefully evaluating and analyzing the legal doctrine, the legal framework, and the case laws in a manner that is logical, methodical, and scientific.

Research Objectives
1. To study the basic notions of Artificial Intelligence and Machine Algorithms.
2. To understand the relevance of AI and algorithms with the advent of increasing competition.
3. To analyze the emerging interface between the Artificial Intelligence and Competition Law regime in India.
4. To conclude with some probable solutions and takeaways.

Research Questions
1. How AI and algorithms have proven effective tools in businesses to ace competition in the market?
2. How AI and algorithms are used to distort the fair competition in the market?
3. Whether our Indian Competition Law sufficient to cover all the issues about AI and Algorithms?
4. Whether AI can be made liable for advanced and complex AI collusions or other matters that affect fair competition in the market?

IMPACT OF AI AND MACHINE ALGORITHMS ON BUSINESS
Perks of Having AI and Algorithm Enable Business
The primary goal of technology is to make people's life easier. Technology has unquestionably improved the quality of life for the majority of people. Businesses are now running more smoothly and efficiently than ever before.[14] To put it another way: Algorithms are now well established in the commercial world. Algorithms may be used in every industry, from healthcare to education. Machine learning and artificial intelligence have been the

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[10] Ibid
[11] George Packer, Amazon and the perils of non-disclosure, The New Yorker Feb.11, 2014, *available at* http://www.newyorker.com/books/page-turner/amazon-and-the-perils-of-non-disclosure.(last visited on 22 April 2022)
[12] Will Democracy Survive Big Data and Artificial Intelligence?, Scientific American Feb. 25, 2017,https://www.scientificamerican.com/article/will-

democracy-survive-big-data-and-artificialintelligence/.(last visited on 23 May 2022)
[13] Ezarchi and Stucke, Artificial Intelligence & Collusion: When Computers Inhibit Competition, Oxford Legal Studies Research Paper No.18/2015University of Tennessee Legal Studies Research Paper No. 267.
[14] Ramesh Padamanabhan, Algorithm trading can help make gains in stock markets, Business today. in

driving force behind the widespread use of algorithms. These advancements allow the use of algorithms in a broader range of corporate organizations.

Algorithmic trading (also known as automated trading, black-box trading, or simply algo-trading) is a great illustration of how algorithms are being used in the marketplace. There are a variety of mathematical models that may be used to establish the rules. Algorithmic trading, in addition to providing profit chances for the trader, increases market liquidity and eliminates emotional human influences on trading activity."[15]Trading at high frequency or volume is dependent on algorithms, which play a critical role. The goal of high-frequency trading is to join and leave the market fast. Otherwise, trading loses its function. Because of the employment of algorithms, it is possible to enter and leave the market in a matter of milliseconds.[16]

Healthcare is another area where algorithms come in helpful. Algorithms speed up diagnosis, resulting in the more effective use of recommended medications. It speeds up the diagnostic process for physicians, allowing them to begin therapy more swiftly and with more efficiency.[17] When it comes to algorithm development for medical practices, MEDAL is the undisputed leader in the industry.[18] There is a strong case that can be made for the use of algorithms in business, as shown by the instances cited above. When it comes to anti-competitive practices, the usage of algorithms and AI-enabled devices might be justified. Competition law's primary goal is to improve the well-being of customers, therefore let's look at this problem from a different angle.[19]

Enhance Consumer Knowledge and Transparency

Academics shouldn't need much convincing that data is a valuable resource: knowledge is power. No one in the field of economics would argue against the importance of information and openness in the market.[20] Consumers now have unprecedented access to information thanks to the rise of e-commerce. Previously, customers had to deal with pricing discrimination and a great deal of ambiguity. They used to discriminate against customers based on their income, but now vendors are more open about their pricing. Because prices aren't displayed and the merchant is charging whatever he wants, shopping may be a frustrating experience.[21]

Consumers benefit from more market openness, while sellers benefit from increased efficiency as a result of the increased availability of market information. Consumers may easily compare the prices and quality of competing items in an open market where information is freely exchanged. It also puts pressure on the vendors to be more efficient, since the buyers have so little leeway to go to another product if they don't like what they see.[22]

Small Fences to Enter in the Market

A company must be able to enter a market before it can compete there. Before entering a new market, every company takes a look at the obstacles it faces.[23] A market with a low entry barrier usually favours consumers since there is always the risk of a new player joining the market and cutting into the incumbent companies' market share. It is often assumed that corporations cannot wield market power for an extended length of time if entrance into the market is simple and the likelihood of gaining market share is high.

Even a small-scale company may join the market and compete with the giants' thanks to the internet. As a result of their success, the giants of today have essentially eliminated the giants of the past, making them obsolete in the market. Facebook, for example, displaced Orkut as the dominant social networking platform. Brick-and-mortar stores are no longer necessary to establish a company in the internet market; all that is needed is a website and cooperation with a browser.[24] The cost of starting a firm, or the cost of entering the market, is much lower under this model than in the traditional business model. It also encourages entrance by delivering a rapid reaction from the customers, since here, producing ads is affordable and simple. In the Nestle/Perrier merger case, the European Commission has thrown light on the fact those

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[15]Shobhit Seth, Basics of Algorithmic Trading: Concepts and Examples *available at*: http://www.investopedia.com/articles/active-trading/101014/basics-algorithmic-tradingconcepts-and-examples.asp (Last visited on 23 May 2022)

[16] Ezrachi and Stucke, Artificial Intelligence & Collusion: When Computers Inhibit Competition, Oxford Legal Studies Research Paper No.18/2015University of Tennessee Legal Studies Research Paper No. 267.

[17] Ibid

[18] Ibid

[19] Ezrachi, A. and M. Stucke (2017), "Artificial Intelligence & Collusion: When Computers Inhibit Competition"3, University of Illinois Law Review 22 (2017)

[20] George. J. Stigler, The journal of political economy, the economics of information, 1961.

[21] Supra note 17

[22] Kevin D. Ashley, *Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age* (Paperback – New York University Press, 2017)

[23] Competition and Barriers to Entry, OECD 2007

[24] Supra note 2

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advertising and marketing expenses as a sunk cost.[25] Thereby, barring access when massive publicity and promotion are necessary to reach the market[26]

Boosts the Power of Customer

The inverse relationship between market power and buyer power is the only way to define buyer power consistently. It's a no-brainer for academics that market power and buyer power are mutually exclusive. The seller's market dominance gives it the freedom to behave without regard to its rivals, clients, or consumers.[27] Customers may easily compare the prices of similar products offered by different companies thanks to the online platform. In the case of a "leather wallet," for example, you may compare the price, quality, and other factors at any time and come to a well-informed conclusion.

Because of the ease with which new players can enter the market and the ease with which data is readily available, companies are wary of charging excessive prices or offering inferior products for fear that their customers will switch to one of their current competitors or a new player may enter the market at any time.[28] In a Forbes piece, eBay's dominating position was examined. Competition inside the industry, customer bargaining power, and the potential of new entrants was cited as the three main drivers that might put eBay's company at risk. eBay confronts great rivalry, which restricts assessing improvements in it working center. New businesses are constantly emerging in the worldwide online company showcase as a result of the typically reduced costs associated with entering and leaving the market. This has the effect of increasing the level of competition.[29]

The vast majorities of internet businesses is expanding at a quick pace and are very dynamic.[30] When deciding to give its blessing to Microsoft's acquisition of Skype, the European Commission took into consideration the dynamic nature of the market.[31] It was stated that consumer communication is a "recent and fast-growing

industry that is marked by short innovation cycles in which significant market shares may turn out to be transitory" while the general court upheld the commission's ruling.[32] For the EU commission to be successful it must be able to show that the harm done to competition as a result of market dominance is not inevitable in such a dynamic marketplace.[33]

Impact of AI and Algorithms on Competition Law

The astonishing growth in the automation of computing operations and the rapid expansion in the tech industry have transformed the way in which we interconnect, communicate, and trade information with one another.[34] One of the most blatant evidence of our ever-increasing reliance on technology and the internet can be seen in our changing buying habits. Online retailers are now more popular than traditional brick-and-mortar establishments. The landscape of competition law has also been altered as a result of the move to the digital market. Because technology is now in everybody's hands, businesses have been forced to adapt and behave in ways. Algorithms and artificial intelligence have become more important as the world becomes more digitalized. [35]

Consider well how AI is important for firms to succeed and how it relates to competition legislation. Let's look into it. New market players have the power to track customers' behaviours, acquire data, and respond in real-time to their actions. Discriminatory pricing may be achieved via the use of sophisticated data and algorithms that are used to tailor and behaviorally target commercials to specific consumers.[36]

The data-driven economy has also seen an uptick with an increase in the number of e-users. Greater and greater data from customers is being sought out by the players, as well as technologies that can process or analyze the data in a short period. Many examples of corporations adopting algorithm-based software to match pricing changes by other rivals have been documented in the near past. [37]The Making

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[25] Neha Soni et al., Artificial Intelligence in Businesses: from Research and Innovation to Market Deployment, 167 PROCEDIA COMPUTER SCI. 2200, available at https://www.sciencedirect.com/science/article/pii/S1877 050920307389.(Last visited 20 May 2022)

[26] Nestle/Perrier [1993] 4 CMLR M17, para . 97

[27] W. Kip Viscusi, Joseph E. Harrington, Jr., & John M. Vernon, Economics of Regulation and Antitrust 294 (2005)

[28] Supra note 2.

[29] eBay Through The Lens Of Porter's Five Forces, Nov 24, 2014, available at: https://www.forbes.com/sites/greatspeculations/2014/11/24/ebay-through-the-lens-of-porters-fiveforces/#74222a81dd14(Last visited on 20 May 2022)

[30] Supra note 2

[31] Peter Bright, available at https://www.wired.com/2011/05/microsoft-buys-skype-2/(last visited on 20 May 2022)

[32] In Case T-79/12, Cisco Systems Inc v Commission para 69, available at:http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A62012TJ0079

[33] Ibid

[34] Supra note 11

[35] Avinash M. Tripathi, Designing competition policies for the age of AI, Livemint Mar. 9, 2018, *available at* https://www.livemint.com/Opinion/cgb8hI830DpAIzuLCQ2ZaP/Designing-competition-policies-for-the-ageof-AI.html. (Last visited on 13 April 2022)

[36] Ibid

[37]Ezrachi, A. and M. Stucke (2017), "Artificial Intelligence & Collusion: When Computers Inhibit

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of a Fly by Peter Lawrence, a genetics textbook, was discovered to be advertised on Amazon.com at a ridiculous price of $23,698,655.93.

There were two shops utilizing automated pricing software, and their algorithms were built in such a manner as to inflate the book's price to an amusing level, it was discovered after an investigation.[38] The deep mind program developed by Google, which astonished the world by claiming to be able to defeat the grandmaster of Atari games, is another good example. These are believed to be the most complicated games ever created by man, with billions of patterns and requiring keen intuition to win. Google's AI programmed trounced the grandmaster by four games to one, despite the game's intricacy.[39]

Uber startled everyone in 2014 when it launched. 'God View,' an internal business tool, makes it simple to follow customers, according to two former workers who spoke to Buzz feed news reporters. The program was developed to display the precise location of its passengers and Uber's automobile. Keeping track of consumers was made easier for UBER, putting riders at risk of being exploited. Facebook, a powerful social networking corporation, has a massive database of its members, and combining that data with algorithms can do wonders for the "social networking" company. It could be useful for bettering the targeting of tailored advertisements and marketing.[40]

In 2016, the corporation explored the potential of combining artificial intelligence with its large store of user data at a conference. People will be able to converse with Messenger bots in the same way they converse with friends, according to Facebook CEO Mark Zuckerberg, who emphasized that AI and natural language processing, along with human support, would enable consumers to speak with bots in the same manner they talk with friends.[41]. People will be able to communicate with messenger bots in the same way they communicate with friends, thanks to AI and natural language processing paired with human assistance.[42]

Because of the aforementioned reasons, smart and self-learning algorithms have seen meteoric growth and progress in recent years, as they can aid organizations with price choices, planning, commerce, and logistics.[43] This has resulted in significant investment in deep learning by major market participants such as Google and others.[44]

The question arises as to why we are considering Artificial Intelligence in the context of competition law. Would there be a danger to competition in the market, or is this merely a benign contribution to greater market competitiveness? The application of Artificial Intelligence in the conduct and marketing of different organizations is highlighted in the examples above.[45] The competitive concern comes when these technological technologies and inventions are exploited by businesses to stifle market competition to increase profits.[46]

INTERFACE BETWEEN AI AND COMPETITION LAW
Implication of an AI
Big data and technology breakthroughs are neither excellent nor horrible, and they are certainly not impartial. Regardless of whether or whether their motivational impulses are aligned with our interests, their ramifications depend on how organizations or corporations use them. To prosper in a competitive environment, we need vast amounts of data and extensive analysis of that data. In any event, we cannot assume that we will always be better off. It's easy to see flaws in the new market flow when you look at the mind-boggling calculations that drive it. There are more hazards to our prosperity than most people realize.[47]

Because of the rapid growth of technology and the explosion of available data, corporations are now able to influence the behaviour of individuals by forcing

Competition"3, University of Illinois Law Review 22 (2017)

[38] Andrew Couts, Why did Amazon charge $23,698,655.93 for a textbook?, *Digitaltrends available at:* http://www.digitaltrends.com/computing/why-did-amazon-charge-23698655-93-for-atextbook/ (Last visited on 21 May 2022)

[39] Available at: https://www.wired.com/2016/03/googles-ai-wins-fifth-final-game-go-genius-lee-sedol/

[40] Supra note 2

[41] Josh Constine, Facebook launches Messenger platform with chatbots, *available at*: https://techcrunch.com/2016/04/12/agents-on-messenger/ (Last visited on 29 May 2022)

[42] ibid

[43] Assad, S. et al. (2020), "Algorithmic Pricing and Competition: Empirical Evidence from the German

Retail Gasoline Market", *CESifo Working Paper* No. 8521, *available at* https://www.econstor.eu/bitstream/10419/223593/1/cesifo1_wp8521.pdf. (Last visited on 29 May 2022)

[43] ibid

[44] Available at: www.cbinsights.com/blog/artificial-intelligence-venture-capital-2014/

[45] Supra note 55

[46] Competition and Markets Authority (2021), *Algorithms: How they can reduce competition and harm consumers*, *available at* https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-competition-and-harm-consumers/algorithms-how-they-can-reduce-competition-and-harm-consumers#theories-of-harm (Last visited on 13Mar, 2022)

[47] Ibid

them to follow their predetermined guidelines.[48] A research that was conducted by the White House on big data found that there is a growing opportunity for big data analytics to have an immediate influence on the decisions that are made regarding a person's life or the surroundings that they are in at any given moment.[49]

Examples of high-speed data include click stream data, which records users' online activities as they interact with website pages, GPS data from mobile phones, which monitors users' whereabouts over time and in real-time and social networking sites that use web-based technology and are widely disseminated. There is a growing need from businesses for this data to be analyzed quickly so that it may be used to their advantage.[50] The application of AI and algorithms to the study of large amounts of data has made it possible to get enormously meaningful insights from the vast quantities of data that are already available. When it comes to providing the same degree of insights and information, a researcher has traditionally had a tough time competing with machines.

This implies that, when we use the internet to seek anything useful, we pay our service provider in terms of the amount of data he receives. The service provider may use the information it receives to grow its company and to better understand the needs of its customers, allowing it to tailor its offerings to those needs.[51]

Interest-Based Advertisement

Adverts may target specific customers based on their interests and previous purchases via personalized advertising, which is also known as interest-based advertising. Target marketing is another title for it.[52]

Advertisers used to pay a magazine or TV station to rent their audience and then attempt to get their attention – but that is no longer the case. For the time being, the most important factors are the exact moment and location. Advertisers are aiming to connect with the right people, at the right time, in the right place.

If they are going to achieve that, they will need a cutting-edge, personalized interaction – one that makes predictions about customers and their behaviour based on data gathered about whom they are, their activities, and where they travel.
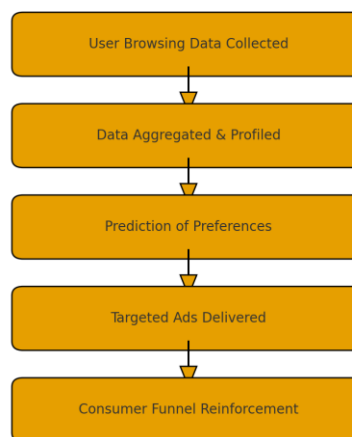
Consumers get the advantages of tailored advertising, and there's no doubt about that. Nevertheless, there is always a concern about the use of data in such a manner that personal information about the customer is compromised while also limiting the customer's alternatives.

Fig 1: - Step-by-step functioning of AI-driven personalized ads

To follow customers across numerous devices and connect their physical, mail, and online conversations, companies are using unique, all-inclusive identities. No longer are we talking about only one connection between a customer's PC and a portable device. Firms would want to go after customers over all of their linked devices, including mobile phones, tablets, PCs, related TVs, and even smart watches and other wearable. Clients are often unable to tell that this new method of tracking has been implemented.[53] Nowadays most competition authorities consider limiting the alternatives available to customers to be anti-competitive. There comes a point in the use of tailored advertising when it comes close to reducing the choices available to customers. To illustrate this point, consider the following scenario: A guy gets bombarded with advertisements for the same brand of shoes since he once looked out their prices. There are now several advertisements popping up on his computer screen every time he logs onto the internet or uses a web browser.

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[48] Competition and Markets Authority (2018), *Pricing algorithms: Economic working paper on the use of algorithms to facilitate collusion and personalised pricing*, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithms_econ_report.pdf. (Last visited on 14 May 2022)

[49] Big Data: Seizing Opportunities, Preserving Values, Executive Office of the President, may 2014, *available at:*

https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf (Last visited on 14 May 2022)

[50] Ibid

[51] Supra note 2

[52] Personalized Marketing, *available at*: http://www.marketing-schools.org/types-of-marketing/personalized-marketing.html, (Last visited on 14 May 2022)

[53] Ibid at p 2

Discriminatory Pricing

Differentiating pricing for various types of clients is what is meant by price discrimination. The customer's willingness to pay, not the real cost of the product or service, is the most common basis for price discrimination.[54] Various consumers' reservations are used as a chess piece by these companies. One such option is to offer clients alternative product options based on their prior purchases.[55] If client X wishes to purchase a cricket bat for 1000 rupees for a standard tennis ball cricket bat, the seller may simply sell a cricket bat for 600 rupees for rupees 1000 if he can estimate the reservation price of customer X in any way. Discriminating and reducing the customer excess for customer X as a result. On the other hand, if the customer's reservation price is low, the vendor will charge less. One such case in point is when a store has a general concept of how much each consumer is willing to spend on an ice cream cup. An ice cream fan may be charged excessive prices by the merchant, whereas a person who doesn't care about eating ice cream could be charged fair prices.[56]

Here, it is needed for the seller to split its clients and recognize the quantity supplied by every customer or set of customers.[57] Think of a vintage goods store where the owner has not revealed the pricing of the things for sale. 'Customers' reservation prices, or the utmost amount a client is ready to spend, are what the shopkeeper is constantly aiming for. Consider the scenario in which A visits the store and purchases an item when the storekeeper notices the customer's reservation price. The consumer will be forced to pay the full amount after the transaction. When the merchant reads customers' reservation pricing, individuals will pay varying rates for the same product—some may pay 2000 rupees, while others may only be willing to pay 800 rupees. To maximize profit, a shopkeeper must gobble up the entire customer surplus, which reduces or eliminates the social welfare and interests of customers.[58]

Due to a lack of knowledge and data, vendors were unable to accurately price discriminate among clients in the past. To correctly determine the reservation fee for clients, they use the information and consumer data. Because of the proliferation of big data and information, businesses nowadays are better able to price discriminate. Corporations acquire information

about us with each click. Every time we use the internet, we learn a great deal about our health and finances. Businesses have access to every detail about us, from what we consume and where we keep our items. There is Discriminatory Pricing by Computer Algorithms, according to ProPublica writer Julia Angwin who spent a year researching it. It was explained to her in an interview how firms utilize our personal information to determine our costs.

When she did her investigation, she discovered that every website you visit builds itself the instant you enter, and you can tell because your adverts are tailored to you. There are instances when a company will set the pricing of a product depending on where you reside, not just the product itself.[59]

Amazon.com Inc. accomplished the same thing in 2000 by offering a range of DVDs for sale to consumers. It was just a trial, according to Amazon, and those who paid extra got their money back.[60]

According to the Wall Street Journal, Rosetta Stone, a company that provides language learning software, "occasionally tests and offers alternative product "bundles" in different areas." In addition, they propose consumers depending on the path they use to access their website, which implies - whether via a social network link, PC, Google or an android - that they are also.[61] Spokesman: "We are more focused on segmentation and targeting since every consumer is unique." "The Consumer Federation of America produced a survey that indicated that motor insurers in the United States charge African American community individuals much higher quoted prices than American whites."[62]

In addition, Allstate, one of the biggest insurance companies in the United States, was also punished for its "market considerations" algorithm.[63] It sought to charge individuals as much as possible by estimating how likely it was that they would compare prices before purchasing insurance. Critics include the algorithm's promotion of "zero risk" selective pricing, which may result in discounts of up to 90% off the ordinary rate or premiums that are expanded by up to 800%.[64] Customers are also given discounts and rebates based on their shopping behaviours and preferences.

Amazon, for example, may be able to understand a customer's preferences based on his browsing history and prior purchases. When it comes to shopping for apparel, the company has determined

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[54] Supra note 2

[55] Herbert Hovenkamp, An Analysis of Antitrust Principles Applied to Intellectual Property Law, (3rd Ed, 2016)

[56] Supra note 11

[57] Ibid

[58] Ibid

[59] ProPublica Reveals Discriminatory Pricing By Computer Algorithms, available at:

http://www.npr.org/2016/10/19/498582157/propublica-reveals-discriminatory-pricing-by-computeralgorithms

[60] Ibid pg 5

[61] Ibid

[62] Consumer Federation of America, CFA news updates, *available at:* http://consumerfed.org/cfanewsupdate-11242015/.(Last visited on 14 May 2022)

[63] Supra note 2

[64] Supra note 73

that this specific consumer is not a fashionista and has no particular brand preferences. In this situation, the business will provide significant discounts and solely present non-branded items since there is a high likelihood of selling products from non-branded firms, enticed by the enormous discounts.

Companies may now more easily maintain tabs on their customers' habits thanks to technological advancements. Today's technologies are incredibly efficient and can infer a complicated data set into highly helpful information for companies. The firm's capacity to price discriminate has increased thanks to computer analysis of customer data.

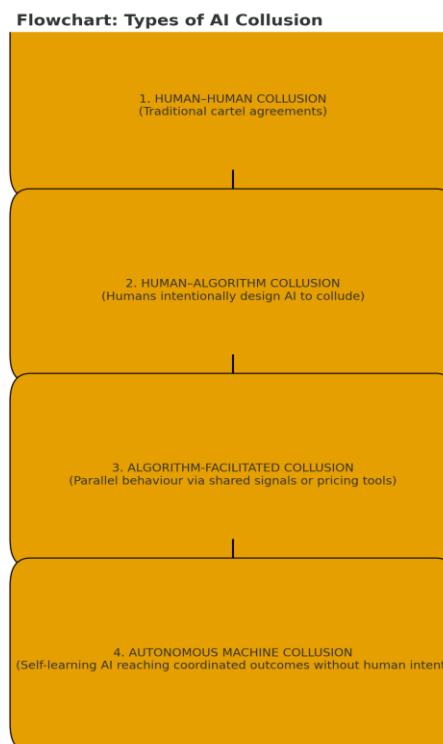## CHALLENGES IN ENFORCING THE LAW

After delving into the nitty-gritty of algorithmic and artificial intelligence advancements, our discussion focused on how the algorithms have reshaped the competition law framework. As a result of this evolution, the competition authorities face several possible enforcement issues in this chapter.

Discovering cartels was difficult enough, as we've previously established. The current circumstances have exacerbated the problems faced by the government. Anti-competitive activity has become increasingly difficult for the authorities to uncover. Second, they lack the necessary tools and measures to deal with the issue even after detecting it. Antitrust laws may not be able to address these concerns because of the difficulty of determining human responsibility for the actions of a computer. Finally, despite possessing the necessary means, the authorities are still unsure of when and where to interfere.

Lack of Sufficient Provisions

We've arrived at the crux of the matter. Whether or whether the current meaning of "agreement" under the competition law is extensive enough to include the collusion situations mentioned in chapter 3 is a question of definition and scope. For this discussion, we'll be concentrating mostly on how "agreement" is interpreted and defined, and how this affects the statutory ability to handle the challenges posed by the algorithm-driven economy.

Fig 2: Types of AI Collusion

Flowchart: Types of AI Collusion

1. HUMAN–HUMAN COLLUSION (Traditional cartel agreements)
2. HUMAN–ALGORITHM COLLUSION (Humans intentionally design AI to collude)
3. ALGORITHM-FACILITATED COLLUSION (Parallel behaviour via shared signals or pricing tools)
4. AUTONOMOUS MACHINE COLLUSION (Self-learning AI reaching coordinated outcomes without human intent)

Is it possible to condemn cooperation between people and robots, or just between humans and computers? This is a typical moot point in our collusion situations. Despite the additional enforcement obstacles that we shall explore later, these situations are not beyond the grasp of the enforcement agencies themselves. Let's take a look at the whole spectrum of 'agreement', from the beginning of a deal through its finalization.

The commission is empowered under the Competition Act to prevent businesses from suffocating competition in the Indian market. The Act's primary purpose is to improve consumer welfare. Under Section 3 of the Act, anticompetitive agreements between businesses are prohibited. The company is prohibited from entering into an anti-competitive arrangement that has a significant adverse effect on competition within India under Sub-Section 1 of Section 3.[65] Sub-section 3 of Section 3 expressly forbids collaboration between enterprises, as follows:

"Any agreement entered into between enterprises or associations of enterprises or persons or associations of persons or between any person and enterprise or practice carried on, or decision taken by, any association of enterprises or association of persons, including cartels, engaged in identical or similar trade of goods or provision of services, which-

(a) directly or indirectly determines purchase or sale prices;

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[65] The Competition Act of 2002, s.3(1)

(b) *limits or controls production, supply, markets, technical development, investment or provision of services;*

(c) *shares the market or source of production or provision of services by way of allocation of the geographical area of the market, or type of goods or services, or number of customers in the market or any other similar way;*

(d) *directly or indirectly results in bid-rigging or collusive bidding, shall be presumed to have an appreciable adverse effect on competition:"*[66]

The term 'agreement' under Indian competition law has a completely different meaning and scope than the phrase 'agreement' in the Indian Contract Act, 1872. Under Section 2(b)[67] of the Indian Competition Act, the term "agreement" is defined as follows:

"Agreement" "includes any arrangement or understanding or action in concert,"—

(i)   "whether or not, such arrangement, understanding or action is formal or in writing;" or

(ii)   "whether or not such arrangement, understanding or action is intended to be enforceable by legal proceedings;"[68]

The term 'agreement' has a very broad meaning in this context; it encompasses any kind of arrangement, understanding, or action, whether written or not, and the form of the action is irrelevant to this Act.[69]

As stated in Section 2 of the Act, the term "agreement" covers a wide range of meanings (b). However, the presence of such an "accord" must be shown indisputably."[70] Under Indian law, the situation is similar to that of the European Commission, which means that to hold a firm or enterprise accountable under Section 3 of the Competition Act, there must be some sort of agreement between the two parties. Although an explicit agreement is not required, some form of agreement is required

CONCLUSION

According to the findings of our research, the shift in market dynamics brought about by data and algorithms is not always problematic. Self-learning robots and data have the potential to reshape the market for the benefit of consumers and businesses alike. It's beneficial for everyone, not just the customers, and it's excellent for the country's economic well-being as a whole. So far we've spoken about how it can assist cut our search costs by increasing transparency and decreasing entrance barriers. The new competitive environment, however, is not without flaws; it has the potential to seriously harm the competition. Price discrimination and collusion are two of the key risks posed by algorithms and self-learning computers. Both eventualities, especially collusion, may worsen the market situation for consumers and competition authorities in both sorts of scenarios, we discovered. While the algorithms and self-learning machines themselves aren't necessarily harmful, it's how they're employed by market participants that are. Both the risks and benefits of the algorithm used must be thoroughly investigated if we are to maximize the well-being of our customers. A delicate balancing act must be struck between the drawbacks and virtues of an algorithmic and AI-enabled economy.

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[66] Ibid

[67] The Competition Act of 2002, s.2(b)

[68] Ibid

[69] Neeraj Malhotra v. Deutsche Post Bank Home Finance Limited (Deutsche Bank), Case No. 5/2009, December 2, 2010

[70] Ibid