# Protecting competition and consumers without stifling technological advancement

**Abstract:** The use of Artificial Intelligence (AI) has become increasingly normalised in our modern world. This has inadvertently resulted in harm to competition and consumers. Despite its growing use, Singapore's competition and consumer protection laws have not evolved sufficiently to address the nuances in competition and consumer harm that have surfaced as a result of AI. Regarding consumer harm, we identified how data collection used to facilitate AI algorithms could intrude consumer privacy and AI algorithms used to segregate consumer groups may discriminate against consumers. For competition harm, we observed how AI-driven pricing algorithms could facilitate collusion and online recommendation systems powered by AI could perpetuate abuse of dominance. Four aspects of AI - privacy concerns, autonomy, bias and an overarching problem of a lack of transparency - present in the aforementioned cases and complicate the application of our competition and consumer law in them. Thus, we aim to improve the enforcement of our current laws with additional policies. We recommended to have firms communicate their AI algorithm's boundary conditions to the consumer, to improve consumer awareness of how their data will be used. To enforce a firm's liability for their AI, we suggested for mandatory safeguards to be established in their algorithms. Lastly, to reduce ethical concerns and improve system transparency, we push for compulsory annual audits on AI algorithms. Whilst having their limitations, our policies are adaptable to change with the evolving state of AI in Singapore, presenting a much needed solution to our problems today.

# 1. Introduction

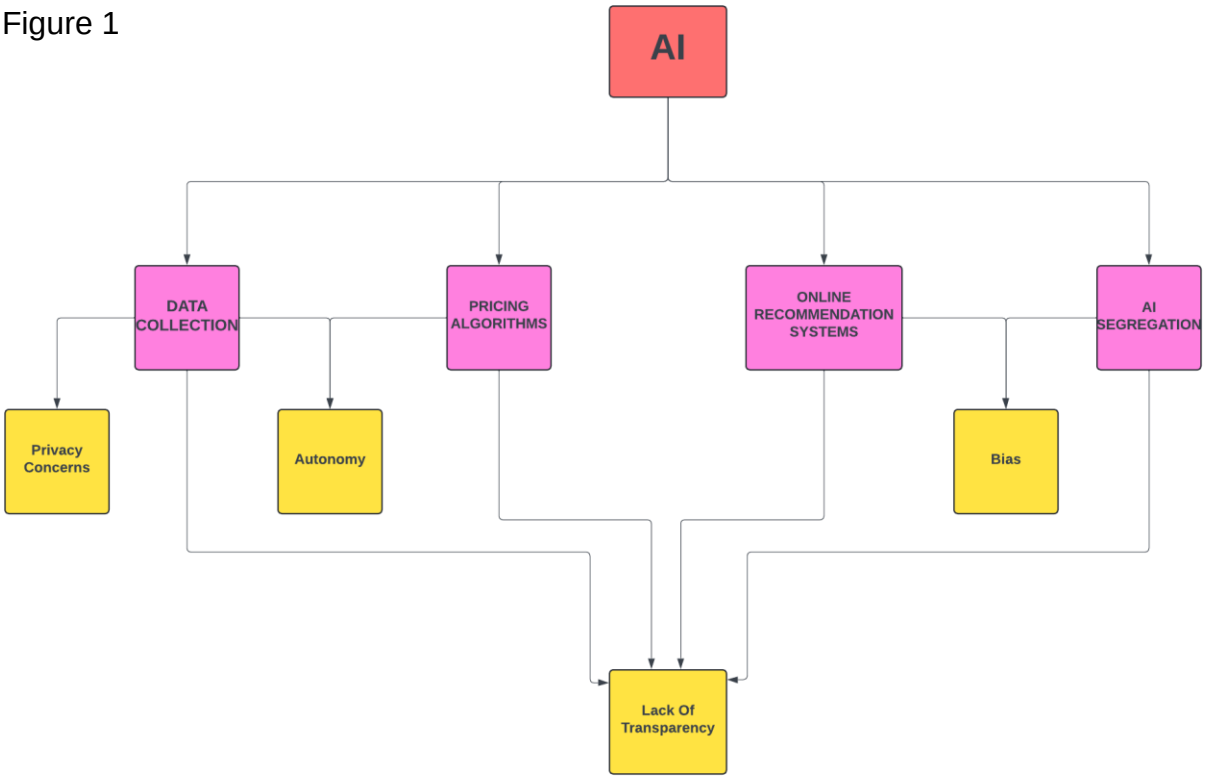
Singapore's competition and consumer policies have served us well since their creation. The Competition Protection Act 2004 has protected firms from anti-competitive behaviors, the Consumer Protection Act 2003 has protected consumers from unfair practices, and the Personal Data Protection Act 2012 has protected consumers' data when it lands in the hands of firms. However, with Artificial Intelligence (AI) entering the workings of everyday transactions today, these laws which have their roots in an age before AI's rise have grown to lack adequate relevance and ability to protect competition and consumers. Therefore, this essay will address how the various aspects of AI impact Singapore's consumer and competition protection policies, as well as provide insight into how the government can further protect competition and consumers without stifling advancement.

## 2. How AI implicates competition and consumer protection policies

AI has four features that create problems for our competition and consumer protection policies. Many AI algorithms are blackbox systems, in which the internal decision making process of the algorithm is incomprehensible to everyone, including its programmer. This leads to the first key feature of many AI systems: a lack of transparency. The second feature lies in the inherent biases present in AI systems. In the end, AI is a human product. Thus, traces of human flaws can be found in its systems, be it due to biases in training data or programming biases. Additionally, advanced AI systems are often autonomous - they achieve their goal by learning to work without directions from its programmer. This is the third feature of AI and is what makes AI able to exceed human capabilities in certain cases. Lastly, discussions of AI are rife with concerns of user privacy. With predictive AI being founded on the datasets of people, it is inevitable that users have raised concerns on the extent and manner in which their data is being used for the algorithm.

These features are found in four specific ways AI is implemented in our daily lives - Data collection, pricing algorithms, online recommendation systems, and automated segregation. They do not exist independently, often coexisting within each individual aspect of AI's usage, as illustrated in Figure 1 below.

Figure 1




## 2.1 AI used with data collection implicating consumer protection policies

For AI algorithms to function, data collection is an essential step for AI programmers. Therefore, many platforms today seek to collect data from its users. They do this through having users agree for their data to be used by the firm to facilitate their AI algorithms in Terms of Service agreements. The issue lies in the autonomous nature of

AI algorithms, that can learn to use the user's data in ways that the programmer has not specified for it to do. Worsening the problem is the opaque nature of many AI systems, causing the firm to be unable to be certain of how the system will use the data. Hence, despite firms relaying to the consumer how it seeks to use their data, it is unable to reliably convey how the data will be used, and thus, users are not made fully aware of how their data is used in the Terms of Service. This sparks debate on whether such firms are truly adhering to the Personal Data Protection Act 2012, in which users have to be made aware of the usage of their data. Especially for sensitive data, such as in healthcare, there is an urgent need to protect the privacy of consumer data, by addressing this area of contention in our consumer protection policies.

## 2.2 AI used in Pricing algorithms implicating competition protection policies

Firms have been using blackbox AI in their pricing algorithms. Greater understanding of the profitability of using AI pricing algorithms has led to a rise of its use in e-commerce, ride-sharing, entertainment industries and more (Bertini, 2021). Despite its advantages, the opacity of such systems makes the nature of the intention of pricing decisions made by firms who use them ambiguous - it becomes unclear as to whether decisions leading to similarities in pricings between firms are a result of conscious parallelism in which firms adjust independently to market changes or collusion between firms (Lovells, 2023). This is further complicated when pricing algorithms of firms learn, autonomous to

the programmer, to signal to and coordinate their behaviour with pricing algorithms of other firms (Freshfields, 2017). Not only is the extent of the firm's responsibility in its algorithms's autonomous decisions debatable, the lack of concrete proof of the blackbox algorithm signalling and coordinating with other firms and the disputable distinction between this coordination and what is defined as an agreement in the law can create a possible loophole in Section 34 of the Competition Act of 2004.

## 2.3 AI used in online recommendation systems implicating competition protection policies

3. Blackbox AI is also increasingly being used in online recommendation systems. This is evident from search engines like Google and digital marketplaces like Amazon that offer users products based on keywords they input. With its rising usage comes more problems with the ambiguous nature of why the algorithm chooses to offer certain products over others. Platforms using algorithms that promote products from firms that have withstanding agreements with the third party platform or from the platform itself can effectively exclude firms from the market and thus perpetuating an abuse of dominance (OECD, 2021). This is illustrated in the Amazon Buy Box case, where the European Commission launched an investigation into Amazon marketplace for potentially favouring its own business and sellers that used its logistics and delivery services when promoting products in a "buy box" (European Commission, 2022). However, due to the process for how products are selected being indecipherable, it is

often difficult to prove that the algorithm is unfairly working in favour of certain firms and placing others at a competitive disadvantage, therefore posing a loophole in section 47 of the Competition Act 2004. Evidently, our current competition protection policies lack sufficient relevance regarding AI.

## 2.4 AI used in automated segregation implicating consumer protection policies

Moreover, Blackbox AI exists to facilitate the transaction of products between firms and their consumers. A prevalent example of this in Singapore today is seen in banks, like the Development Bank of Singapore, and fintech firms using AI credit scoring algorithms to determine consumers' loan eligibility. However, the decision of the AI algorithms may be biased, leading to consumers being provided an unsatisfactory product based on stereotypes placed on them by the system. Yet, in cases such as Google offering higher paying job advertisements to males more often than to females, the ambiguity surrounding the process behind their selection makes it hard for the law to punish them under Consumer Protection Act 2003. This reveals a gap in our current consumer protection policies in the age of AI.

# 3. How the government can protect competition and consumers

In this digital era, competition and consumers can be better protected by tailoring our competition and protection policies to apply to AI. Through our solutions, we suggest how the government may choose to regulate the world of AI while still ensuring that its development remains unhindered, creating a situation where consumers and competition can exist, unharmed, alongside the benefits AI brings to society. Our solutions aim to address each problematic aspect of AI.

## 3.1 Addressing privacy concerns in AI

As a means to improve consumers' understanding of the usage of their data, we can legislate for firms to disclose the boundary conditions of their AI systems to the consumers in the Terms of Service. Boundary conditions refer to the parameters of AI systems set by the programmer that broadly determine its actions and thus, its usage of consumer data. Therefore, consumers are made more aware of the manner in which their data will be used, and are able to make accurate decisions in choosing whether to consent to giving up their data.

However, while this policy attempts to help firms reach a conclusive definition of how it will use consumer data, it cannot completely eliminate the unpredictability of AI's usage of the data. This is because boundary conditions are established by a human programmer, who is unable to anticipate the infinite number of ways AI may choose to act. Hence, the boundary conditions set for the AI system is not an absolute representation of how the consumer's data will be used. Therefore, while the consumers have greater awareness of how their data is used, they are not fully aware of such.

## 3.2 Addressing autonomous AI

Our solution holds our belief that firms should take accountability for the decisions of their AI algorithms. This can be achieved through policies mandating for firms to implement safeguards in their AI systems before and throughout its launch. Firms would be expected to follow safeguarding frameworks established in the Guidelines for Secure AI System Development, developed by the National Cyber Security Centre, and endorsed by the Cyber Security Agency of Singapore (CSA, 2023). This makes it so that firms are made to play a part in preventing their AI's decisions from harming competition and consumers. By assigning firms with legal responsibility over their AI's decisions, they are less willing to let their AI systems run amok, harming competition and consumers while evading scrutiny. Furthermore, this solution works to ensure that our technology advances as desired, keeping in line with the reason AI was developed: to aid us, instead of harming us.

Yet, we also acknowledge that safeguards are not a foolproof measure. Intrinsically, safeguards are unable to absolutely prevent all potential harms of AI. For example, even with safeguards in place, OpenAI, the creators of generative AI ChatGPT, could only reduce rule-breaking responses by 82% but not 100% (Clifford, 2023).

## 3.3 Addressing lack of transparency and bias in AI

When contentious cases arise, Singapore should refrain from simply following the European Union's manner of erring on the side of the law to the detriment of firms, as argued by Khoo and Sng (2019). Instead, we should seek a balance between protecting competition and consumer welfare and promoting the use of AI by firms, through eliminating the reason for ambiguity.

The United States’s recent bill targeting algorithmic price-fixing, the Preventing Algorithmic Collusion Act (Klobuchar, 2024), is something Singapore can learn and improve from. Beyond just requiring companies to permit for audits to be conducted on their systems, annual audits can be made compulsory, and such audits can address not only algorithmic collusion, but also abuse of dominance and algorithmic biases. This is assisted by mandating all firms using AI algorithms to record the processes and final decisions of their AI algorithms. The audits will be performed by the Competition and

Consumer Commission of Singapore through analysis of the system logs and history based on pre-existing existing ethical and transparency guidelines in AI Verify, a government framework for companies to validate their AI through standard testing (IMDA, 2024). Based on such audits, the authorities will have more concrete proof of firms engaging in collusion, perpetuating abuse of dominance or discriminating against consumers through their AI algorithms. Therefore, more firms who violate the Competition Act 2004 and Consumer Protection Act 2003 would be rightfully charged.

With all policies aiming to mould our use of technology, there comes concerns on whether such policies cross the line into stifling technological progress. With that in mind, our solution is geared to go further than just stopping short of stifling technological advancement, instead encouraging it. The additional policies enhance the transparency of AI algorithms, enabling us to develop greater insight into the workings of AI and in turn facilitate technological innovation (World Economic Forum, 2024). Also, as AI algorithms of firms become more transparent, firms facing false allegations of being anti-competitive or harming consumers will find it easier to prove their innocence. With this, firms would better be able to wield AI without the fear of negative repercussions, promoting the use and development of AI technologies amongst firms.

## 4. Conclusion

Overall, our solutions work to make AI more understandable to consumers, as well as mitigate the harms it causes to consumers. Thus, as AI becomes more transparent and reliable, public trust and perception of AI will improve. This trust is crucial to the optimal development of AI (World Economic Forum, 2024). In conclusion, in order to not only elevate our technology, but also minimise competition and consumer harms, Singapore's competition and consumer laws have to evolve alongside the technological landscape.

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