Evaluating the Apple App Store: How Apple Leverages Market Power for Anti-Competitive Conduct and How Regulators Can Change It

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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As smartphones have become ubiquitous, so have mobile applications (apps) that give them their value. Smartphone and platform manufacturers have created systems for distributing these applications where users can browse, purchase, and download apps all in one place. One of these is, of course, the Apple App Store. By this year, consumers are predicted to spend over $150 billion in app stores, and of this sum, about two-thirds will pass through the Apple App Store. This indicates that despite Apple's store having fewer users, each one of them "has been spending about *ten times as much* as Google Play customers," meaning Apple brings in significantly more revenue overall (Bostoen & Mândrescu, 2020, p. 4). Similar projections are shown in Figure 1.

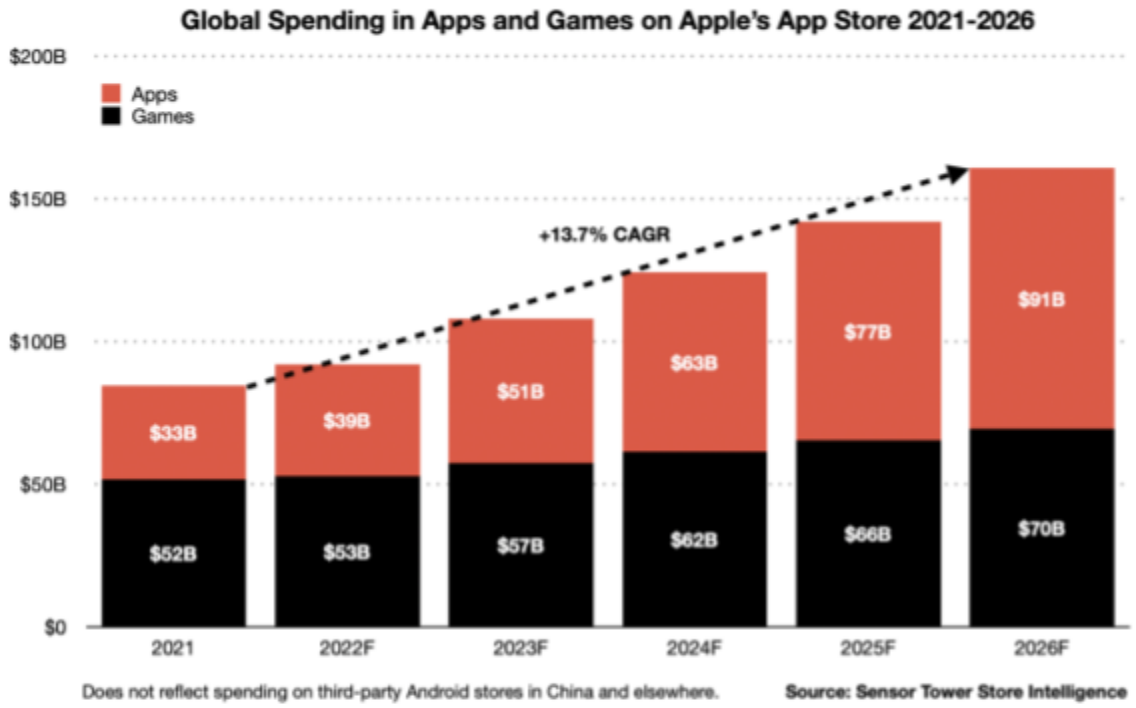

Figure 1. Projections of Apple App Store spending by apps and games. Global spending in the App Store is projected to reach $143 billion by 2025 (Chan, 2022, Non-Game Apps Will Represent the Majority of iOS Spending by 2026).

These staggering quantities show not only how important the Store is to iOS users but also how lucrative the marketplace is for Apple. The App Store has a marked effect on the consumers who download and purchase apps and the developers who make them. For consumers, having a place to simply and affordably browse and download apps is integral to their smartphone experience. For developers, distributing their apps and making money off of them is their livelihood. However, this power and importance have caused the App Store to face growing scrutiny in recent years surrounding the control it has over these groups.

Legislators and consumers are becoming increasingly aware of the monopolistic characteristics of mobile application platforms. In a report assessing app stores in the platform economy, Bostoen and Mândrescu (2020) asserted that developers are accusing Apple of anti-competitive practices including self-preferencing, platform restrictions, aggressive pricing, and anti-steering, all of which may be enabled by its market power. However, Apple claims that its practices are necessary for the maintenance of its platform.

This back-and-forth has put the App Store front and center in a debate about the dominating power technology companies have over their platforms. The App Store is a complex system with many parts, including the software, the iOS operating system it resides in, the developers that make the apps, and the consumers that download, purchase, and use them. Legislation and litigation are rapidly evolving to force the App Store to better meet all parties' needs. However, it is unclear whether Apple's platform practices are anti-competitive at all, and if so, if they are justified. Then, assuming these characteristics exist, it is unclear what and how Apple would need to change.

In this paper, by analyzing journals, legislation, and court cases, I examine arguments alleging Apple's inordinate market power and anti-competitive practices as well as Apple's

responses to why these are absent or justified. I use Callon's actor-network theory and translational model of power to illuminate the App Store system. By examining the dependencies and control within it, it becomes clear how Apple derives power from the system's design. Through these methods and argument analysis, I show how the App Store harms developers and consumers and how the App Store or its home platform could be altered to improve conditions for them.

Apple Holds High Market Power and May Use it in Anti-Competitive Ways

Legal, regulatory, and judicial debates surrounding the App Store have exploded in recent years, and both Apple and its opponents have presented arguments defending and criticizing the Store. I use these debates as case studies showing current political attitudes toward Apple and predicting future ones. Then, I discuss the ambiguity surrounding these proceedings and the need for solutions that have yet to be implemented.

In late 2019, Epic Games, the company behind the immensely popular free-to-play video game Fortnite, launched an attack on the App Store to protest the 30% commission rate Apple takes on all in-app purchases and subscriptions (Belloso, 2021, p. 1). They introduced a covert piece of code into the Fortnite app that would enable a backdoor payments system that would bypass Apple's. When Apple refused Epic's request for a special deal on commissions in June, Epic activated the alternate payments system, and Fortnite was shortly after removed from the App Store, causing Epic to launch a lawsuit in response. Figure 2 provides a summary of these events. The ensuing court case, including Apple's countersuit, helps provide legal verdicts for

much of the App Store debate.

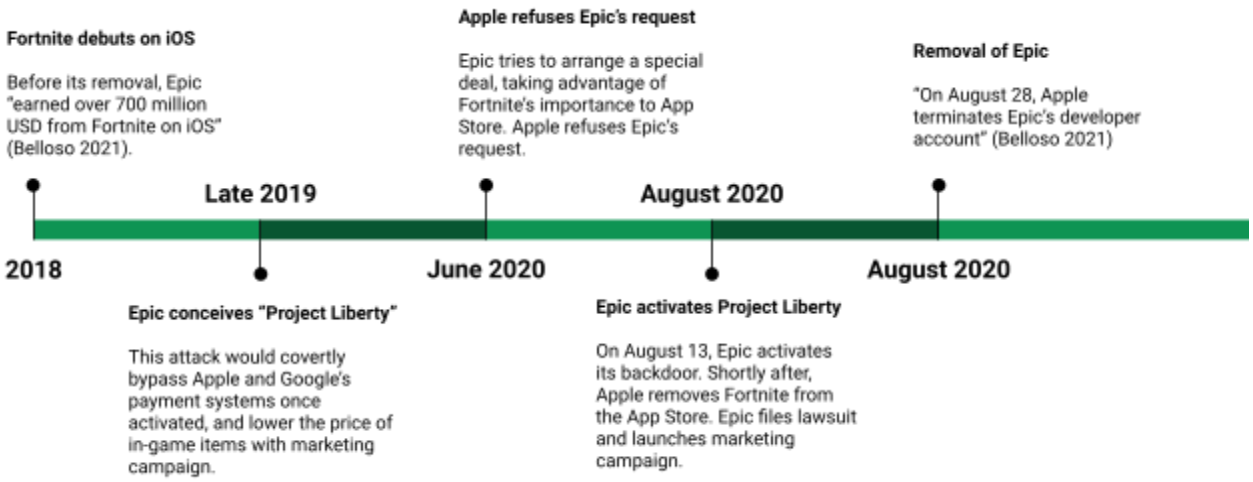

Figure 2. Timeline of events leading up to *Epic v. Apple*. To protest Apple's commission fee, Epic engineered events that would incite the lawsuit and aim to turn public opinion against Apple (adapted from Belloso, 2021, p. 1).

For Apple to conduct itself anti-competitively, it must first have the market power to do so. In a U.S. House report titled "Investigation of Competition in Digital Markets," (2022) the House Judiciary Committee outlined their investigation into "the state of competition in the digital economy," focusing on big tech companies including Apple (U.S. House Committee on the Judiciary, 2022). The report argues that Apple has durable power due to the ecosystem lock-in of Apple and the high costs of switching mobile platforms. This leaves Apple virtually uncontested:

> As a result, Apple's control over iOS provides it with gatekeeper power over software distribution on iOS devices. Consequently, it has a dominant position in the mobile app store market and monopoly power over distribution of software applications on iOS devices. (House Judiciary Committee, 2022, p. 281)

The mechanisms of the App Store in the context of the iOS platform also enable its market power. Apple does not allow third-party app stores on iOS and does not allow third-party app downloads. Therefore, the Store is the only way for apps to reach iOS consumers. However, according to the Court in *Epic v. Apple*, in reference to mobile gaming apps like Epic's Fortnite,

there are other ways for game developers to distribute their games, including other game stores and platforms. Because of this, Epic failed to prove the iOS platform is an essential facility (Belloso, 2021). That being said, the U.S. House report claims that other distribution methods "are often irrelevant to the mobile applications market, not always practical options for users, have significant disadvantages compared to the preinstalled app stores, and offer only limited functionality" (House Judiciary Committee, 2022, p. 78). iOS apps are often the only way gamers may actually play games.

Finally, there are indirect signs of Apple's power: from its high commission fees, Apple has a contested 72% operating margin on the App Store (Belloso, 2021). This unusually high operating margin combined with the relatively high market share are strong indicators of market power.

However, recent court cases may provide more concrete evidence of how the law applies to big tech. In *Epic v. Apple*, Epic had to define the market Apple controls before arguing it has a monopoly over it. Epic argued for a monopoly foremarket of Apple's iOS platform and aftermarkets for distribution of iOS apps and payment processing in iOS apps. The Court rejected all of these. For the foremarket, the Court claims that competition exists for smartphones rather than the operating system. For the aftermarket, the Court found that Epic failed to prove users are locked-in to iOS, citing consumer surveys "suggesting that low switching is due to consumer satisfaction with iOS" (Belloso, 2021). Thus, the Court decided that Apple's claim holds: the relevant market in the suit is the mobile gaming transaction submarket, of which Apple has a calculated 57.1% share. Because game revenue makes up a 76% share of the App Store's revenue, and games use specialized technology, games are distinct from the App Store apps at large.

Despite the mechanisms and indirect signs, the Court ruled in *Epic v. Apple* that the App Store is not a monopoly in its defined market. This is because Epic failed to prove "restricted output": that the high commission fee passes costs down to consumers and causes them to buy less. Epic has since appealed this ruling, with the backing of amicus briefs from 35 states and many organizations (Peters, 2022). Therefore, although lawmakers and courts agree the Store has high market power, they do not agree on if it is a monopoly.

Using its market power, Apple has been accused of multiple anti-competitive practices. One of these is self-preferencing conduct, where Apple takes advantage of its control to preference its own apps. Bostoen and Mândrescu (2020) define "conduct" to include technical, which means limiting an app's compatibility with the operating system (iOS), and contractual, which means using steep commission fees or terms and conditions to outcompete other apps. In the case of *Epic v. Apple*, the Court ruled that there is little objective evidence of self-preferencing (Belloso, 2021). However, there is some evidence to the contrary. Apple has vertically integrated the App Store, becoming both the developers and the distributor, or "acting as both a player and a referee," by introducing their own services, such as Apple Music for music streaming (Geradin & Katsifis, 2021, p. 506). A Wall Street Journal analysis found that Apple's apps "ranked first in more than 60% of basic searches" (Mickle, 2019). Since Apple can aggressively promote its own products, this limits consumer choice and exacerbates the "walled garden" problem, where users are trapped in a platform that has complete vertical control (Hazlett et al., 2011).

Regarding specific apps, a complaint from Spotify to the European Commission alleged that Apple Music can undercut Spotify by increasing margins ("margin squeezing") since only Spotify has to pay the commission fee (Bostoen & Mândrescu, 2020). In addition to this

contractual conduct, Apple also used to prevent Siri from playing songs on Spotify. Thus, the policies of the App Store not only limit the options of consumers but also harm Apple's competitors in a discriminatory way.

Another anti-competitive practice is simply the commission fee. Apple takes a 30% commission fee from all app purchases, in-app purchases, and subscriptions. In 2020, an Apple-funded study "concluded that other software distribution platforms … charge identical or similar commissions on software downloads and transactions and that commissions are common in other digital markets" (House Judiciary Committee, 2022, p. 286). However, developers argue that the fee is in payment processing, taking cuts of in-app purchasing, and not the distribution of apps. Moreover, in *Epic v. Apple*, Epic successfully argued that a third-party app store could likely distribute apps with a lower commission or different features and drive down market prices overall (Belloso, 2021). However, since Apple prohibits other stores, it puts a burden on developers and decreases innovation. Nevertheless, this constraint allows Apple to maintain its 30% fee.

Regarding payment restrictions specifically, there is also the issue of anti-steering. The Store's anti-steering policy means that developers cannot circumvent the commission fee with buttons or links that point to another purchasing mechanism. As a walled garden, it prevents users from using other payment methods. More than preventing, though, users are not aware of other options, unlike a brick-and-mortar store where there are implicitly many competitors. According to *Epic v. Apple*, this violates antitrust law by preventing informed choice among iOS users (Belloso, 2021). This was a key conclusion in the *Epic v. Apple* ruling under California's Unfair Competition Law. Because of it, the Court imposed a nationwide injunction against anti-steering, which has since been put on hold because Apple appealed (Peters, 2022).

Apple has also defended itself with its own claims, centered around the security and quality it provides its users. In *Epic v. Apple*, Apple successfully defended the exclusivity and control of the platform by appealing to the users' safety, as well as the curated high quality of the apps (Belloso, 2021). One primary justification in their claim is security. In the "narrow" sense of security, regarding malware, Apple successfully argued that the App Store, through its review process and centralized distribution, safeguards users from software threats. In the "broad" sense, beyond technical, Apple asserted that the App Store allows Apple to filter objectionable content and fraud and maintain strict privacy requirements. Both kinds of security benefit users by keeping them safe and also benefit developers because users will trust their apps and readily download them. One analogy is with a nightclub, where bouncers decide who gets in and can kick out unruly guests, thus maintaining the well-being of the group as a whole and the value of the club (Evans, 2011). Apple argued that the advantages this format offers outweigh the competitive limitations it imposes. However, Epic successfully proposed alternatives. For example, an "enterprise program" model could certify app stores instead of apps directly. Alternatively, Apple could notarize apps similarly to how the macOS store functions. The Court ruled that these could work just as well. Although Apple claims that tight control benefits users with security, privacy, and quality, opponents argue that those benefits can remain while loosening control.

Even with all of these accusations and extensive debate, much of the evidence is limited and contested, as shown by Figure 3. However, it is clear that Apple has high market power if not a monopoly and that certain characteristics cross the line. Allowing more competition may yield a better ecosystem for established companies, new developers, and iOS users by increasing innovation, affordability, sustainability, and equity, all while still being economically sustainable

for Apple. The question is how each change will affect each group and how that will in turn affect the whole system.

Arguments from Both Sides of Debate	
Opponents (Epic Games, Lawmakers, etc.)	**Apple**
• **High market power**: As shown by limitations on third-party access and high market share • **Self-preferencing**: Apple uses the App Store to advantage its own suite of apps at the expense of competitors • **Commission fee**: Apple takes artificially high cut of app revenue • **Anti-steering**: Developers cannot propose other payment methods	• **Market power**: Users can switch to other platforms if they would like, but they choose iOS • **Security/Privacy**: Apple reviews and vets apps to prevent malware and objectionable content • **App quality**: Since Apple curates its apps, users can expect to find high-quality apps on the Store

Figure 3. Summary of arguments presented by Apple and its opponents (created by author).

Analyzing the App Store System with Actor-Network Theory (ANT) and Callon's Translational Model of Power

Actor-network theory (ANT) is a framework that recognizes that "actors build networks combining technical and social elements" and that these actors are "both constituted and shaped within those networks" (Stanforth, 2007, p. 38). In Carolyne Stanforth's research article, "Using Actor-Network Theory to Analyze E-Government Implementation in Developing Countries" (2007), she applies ANT to e-government systems in Sri Lanka and provides a valuable outline of the framework as well as conclusions about how it should be applied. Stanforth claims that power dynamics are characterized by which actors mediate relationships in the system and control other actors. The App Store has many components that affect each other and influence its design. Analyzing power dynamics similarly to Stanforth makes Apple's advantaged position

clear. I apply ANT to illustrate the App Store system and its actors and show how Apple's role in the system gives it significant power.

Contrary to technological determinism, which suggests technologies emerge and evolve as a function of natural or logical processes, ANT proposes that, according to Bijker and Law, "our technologies mirror our societies" Stanforth, 2007, p. 38). Technologies cannot be separated from society; instead, they are "as much actors in the networks as are the humans" (Stanforth, 2007, p. 38).

An important extension of ANT is Michel Callon's "translation model of power." Power is not simply having authority; rather, it comes from the ability to define actors' relationships and create their cohesion (Callon, 1986). It is always in relation to something or someone else. As Stanforth describes, "the 'power to' enact through others is a social power experienced in relationship with others and is based on an intense activity of enrolling, convincing and enlisting" (Stanforth, 2007, p. 51). Actors can enable "moments of translation" that give them power. These include Problematization, where an actor defines the problem and proposes a solution; Interessement, where the actor makes itself the middleman between other actors; Enrollment, where the actor defines the relationship between other actors; and Mobilization, where an actor becomes the representative of the group (Callon, 1986). These translations make the actor an obligatory point of passage (OPP). Callon argues that maintaining an OPP is key to a functioning system. Indeed, in Stanforth's case study of the Sri Lankan e-government, she found that the lack of an OPP may have impacted the success of the system (Stanforth, 2007).

In summary, as shown in Figure 4, actor-network theory states that technologies, people, institutions, and sub-networks form a heterogeneous network that impacts and is impacted by the actors. An actor's power in the network is defined by its ability to influence the other actors'

goals and relationships, and its ability to become a keystone and middleman in the network.

Summary of Actor-Network Theory and Callon's Power Model
• Networks are a web of "actors" that build and change the network. • Actors include not only technologies but also people, institutions, and sub-networks. • The more an actor affects how other actors relate to each other, the more power it has. • The more an actor is the middleman between other actors, the more power it has.

Figure 4. Summary of key points in ANT and Callon's Translational Model of Power (created by author).

Actor-Network Theory Shows how Apple obtains Power From the App Store's Position in the Network

An actor-network theory analysis requires dissecting the elements of a system and their relationships. I first identify the main actors in this system and then show how Apple uses the App Store as an obligatory point of passage to obtain power in the network.

At its core, the App Store can be thought of as a platform market, an economic platform with multiple sides: developers producing and selling apps and consumers browsing and purchasing them through the platform. The fundamental technology is the Store itself, an application where users can browse apps, purchase, and download them. All app downloads take place through this application. However, the total revenue of the Store is spread across multiple places including in-app purchases and app sales. In-app purchases, true to their name, take place within apps but use an Apple-provided application programming interface (API) to process payments through Apple. Within the App Store, there are applications, which can be considered actors too, as pieces of technology. Other related technologies include Apple's platforms for developing apps, moderating them, and approving them.

The consumers, or users, of the App Store can also be actors. These are the people who own Apple devices, browse the App Store, and download and use apps. They are also the primary revenue driver for Apple, as the actors who spend money on apps and in-app purchases. For this reason, they can be split into distinct groups. Because a small share of users spends the majority of the money on apps, their importance to Apple may be considered much larger than the remainder of users.

Consumers form one side of the market, and the other is made up of developers. Some app developers are independent: either individuals or small companies. Others are backed by large corporations, like Epic Games' Fortnite. Apps often form the counterpart to a web platform, such as Facebook, the New York Times app, or the McDonald's app. The actors behind these apps have drastically different levels of power and influence, and that affects their role in the system: the largest companies have the greatest ability to effect change in the system, but their needs overlap only somewhat with smaller developers.

Finally, Apple itself is a critical actor. It pulls all of the strings in the App Store and has its own slew of apps that are part of it. It thus has direct control over multiple actors, but also

indirect due to the way the network functions. All of these actors are depicted in Figure 5.

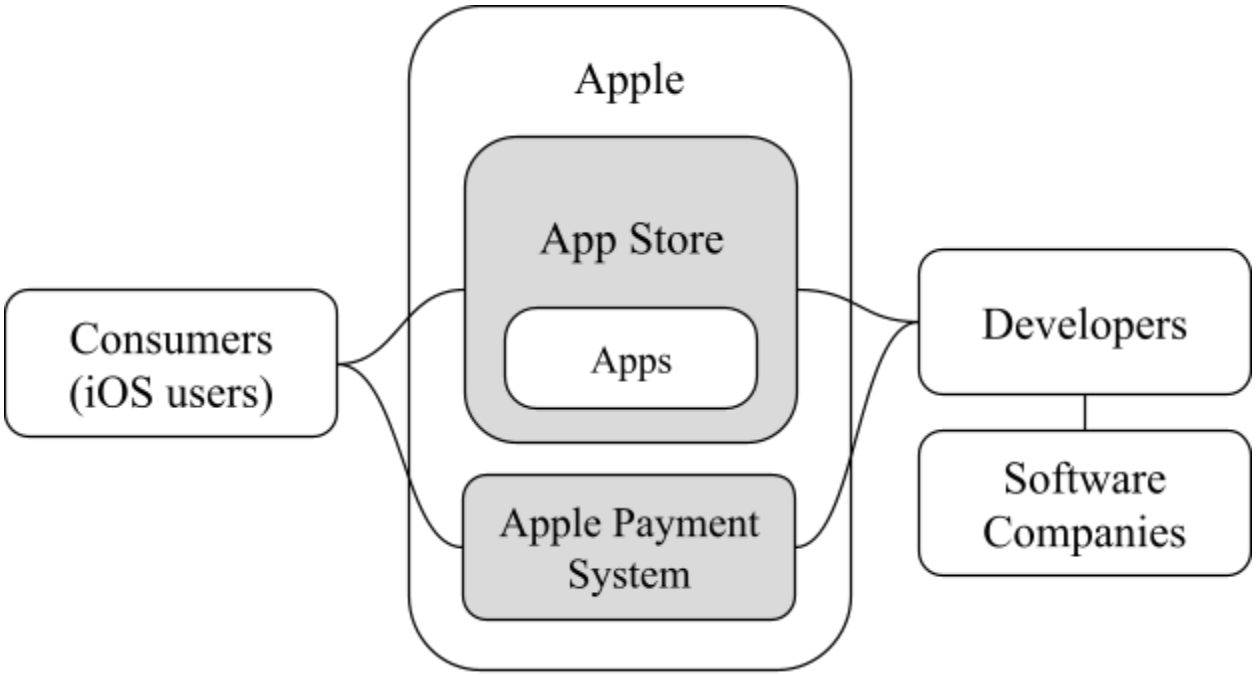

Figure 5. Core actors in the App Store network and their key relationships. As shown, the App Store plays an essential role in connecting consumers and developers (created by author).

Looking at the App Store, we see how Apple has orchestrated moments of translation, as Callon would call them, to position the App Store as an OPP. These steps are summarized in Figure 6. Firstly, with Problematization: developers, especially small publishers, may struggle with outreach and distribution to users. Apple proposes the App Store as the solution. However, this would not be enough to obtain leverage— actors like Epic Games or Facebook do not strictly need the App Store to reach users. This is where Interessement and Enrollment come in. By technologically restricting the iOS platform, Apple forces both sides of the market to interact exclusively through the App Store, making it the only point of passage from developers to consumers (providing apps) and vice versa (spending money). In the App Store, Apple defines exactly how developers relate to consumers, by curating apps, regulating distribution, and

controlling transactions.

App Store's Moments of Translation to Become an OPP	
Moment of Translation	**App Store**
Problematization: defining problem and proposing solution	Developers have no way of displaying and distributing apps to users (at least on iOS). The App Store is the solution.
Interessement: becoming the middleman between other actors	Developers and consumers must sell, buy, and download apps through the App Store.
Enrollment: defining relationship between other actors	The App Store puts terms on how developers and consumers can interact, including payment methods and what apps can be distributed.
Mobilization: becoming representative of the group	The App Store is known as the place to go for getting apps on iOS.

Figure 6. Summary of moments of translation Apple uses to make the App Store an obligatory point of passage. These steps, as proposed by Callon, show that the App Store's power is very intentional (created by author).

Thus, the lens of ANT makes it clear that, far from a monolithic technology, the App Store is a complex network composed of many actors with different interests and compositions. Through Callon's OPP model, we see that Apple maintains a high level of control over the App Store and the network it is embedded in. That being said, Stanforth, and Apple, might argue that this is what makes the network so efficient, by coordinating the needs of users and developers.

Multiple Changes Could Make the App Store More Equitable for All Actors

After reviewing the evidence, including legal arguments in the *Epic v. Apple* court case and various papers and arguments, and analyzing power dynamics with ANT, it is clear that Apple holds high power in the App Store. Additionally, although it may not legally reach the point of monopoly, Apple as it stands right now is too anti-competitive. Because of its practices, including tight platform control, large revenue cuts, self-preferencing, and anti-steering, it

commands dominant market power that it uses to take advantage of consumers and developers. The U.S. House Report minces no words in describing this:

> Apple's monopoly power over app distribution on iPhones permits the App Store to generate supra-normal profits. These profits are derived by extracting rents from developers, who either pass on price increases to consumers or reduce investments in innovative new services. Apple's ban on rival app stores and alternative payment processing locks out competition, boosting Apple's profits from a captured ecosystem of developers and consumers. (House Judiciary Committee, 2022, p. 291).

The App Store must be rebalanced in a way that increases competition and bolsters consumer and developer freedom, and doing so will better meet the needs of the other actors in the network. There are several ways of approaching this, as summarized in Figure 7, which range in scope. These changes will still maintain the benefits that the App Store provides to consumers and developers, including security, privacy, and trust.

Proposed Changes to the Apple App Store	
Change	**Impact**
Allow alternative payment methods	Lets businesses compete with Apple by offering their own payment system, reducing burden of commission fees
Alter revenue model of App Store	Makes companies earning the most pay the most, spreading out costs that often fall on small independent developers
Separate App Store and Apple's products and services	Allow apps to compete directly with Apple's products and services without being disadvantaged by the platform they are on
Allow third-party app stores or app downloads	Increase competition for app distribution, driving down costs and increasing innovation for consumers and developers

Figure 7. Summary of proposed changes to the App Store. If implemented by Apple or enforced by regulators, these could reduce the App Store's OPP position and equalize the network (created by author).

One change that Apple could make, or be required to make, is removing anti-steering. As previously discussed, anti-steering is the requirement that apps cannot directly offer alternative payment methods to users. Allowing "steering" toward other payment methods would broaden consumer choice and permit developers to compete with Apple in the context of in-app purchases. Without anti-steering, apps could feature links and buttons that lead to external payment systems. Apple was recently forced to remove this obligation as a consequence of *Epic v. Apple* because the Court found anti-steering to leave consumers unaware of other options (Belloso, 2021). However, it has not been implemented yet because Apple has appealed this claim. The payment method is one obligatory point of passage that is part of the App Store. Since the developer actors and consumer actors are almost entirely forced to interact through it when making payments, it gives the App Store excess power. Allowing other payment channels to be pointed toward increases and strengthens connections in the network.

More than removing anti-steering, Apple could allow alternative payments directly in the app. In "The Antitrust Case Against the Apple App Store," Geradin and Katsifis argue that this would benefit consumers because "developers would retain control of the customer relationship, thus getting to handle billing issues such as refund or cancelation requests" (Geradin & Katsifis, 2021, p. 581). It could also permit more flexible payment options or complex subscriptions. Presenting all payment options leaves the consumer to decide whether to use Apple's payment system or another option. This introduces beneficial competition.

We are just starting to see legislation in this direction: the European Digital Markets Act, entering into force in November of 2022, will designate "gatekeepers," companies that provide a "core platform service that serves as an important gateway for business users to reach end users"

(Batchelor et al., 2022). Apple will very likely receive such a designation. With this act, Apple will not be permitted to require users to use certain payment services.

What may need to come with opening up payment methods is a more dramatic change: altering the revenue model. Apple only makes money off of 17% of apps, whereas some of the most profitable apps, such as Facebook, are free to download and thus do not generate revenue for Apple, instead earning through other means like advertising (Belloso, 2021). Small independent game developers, on the other hand, who want to sell their game for a fixed price, will have to pay Apple the 30% fee. Apple could change its revenue model to take more fairly distributed cuts. Facing public pressure, Apple recently lowered the commission rate to 15% for developers with less than $1 million in annual sales (Apple, n.d.). Another possibility is reducing or eliminating commission cuts and increasing the $99 developer fee all developers pay. Since this may disadvantage independent developers and startups, pricing could be tiered based on app usage or profit. Tapping into a different source of revenue could spread the costs of maintaining an app over a larger share of apps on the store. This would not diminish gross revenue but could make the Store more equitable. With this system, app developers pay for the services they actually get.

In regards to self-preferencing, policymakers could artificially alter the App Store network by severing the link between the App Store and Apple's own apps and services. As defined by Geradin and Katsifis in "The Antitrust Case," this "functional separation" between the App Store and product development would have both operate independently and with only their own information. It would limit the ability of Apple to use the near-complete market knowledge it has to bias toward its own apps at the expense of its competitors, known as "sherlocking" in the U.S. House report. It could include restricting access to commercially

sensitive data the App Store would have, and would also include governance mechanisms ensuring self-preferencing is not occurring. These changes would help apps like Spotify more fairly compete in Apple's market. The European Digital Markets Act also addresses this topic: Apple will not be permitted to use businesses' nonpublic data to compete against them. It will also not be allowed to rank its own products and services above those of others, eliminating search result advantages (Batchelor et al., 2022).

Finally, Apple could alter the network the App Store is in entirely by allowing competitors to the App Store onto iOS. Introducing competition within iOS would incentivize innovation and may reduce prices for developers and consumers if Apple is forced to compete. For example, Epic undercut Steam, the popular game distribution store, by introducing its own store with only a 12% commission instead of Steam's 30%. With the "enterprise program" model discussed earlier, security and privacy could still be maintained for users.

The European Digital Markets Act will also aim to require allowing other app stores. It includes a provision that Apple must allow the installation of third-party apps and app stores that "do not endanger the integrity of the device or OS" (Batchelor et al., 2022). This may be easy for Apple to contest, however, since it cites the security and privacy of users as one of the most important reasons for the Store. It is also difficult to say if allowing competitors would cause significant change— since Apple maintains such high market power, introducing competitors may not be significant. For example, Google, despite allowing alternative stores on Android, controls a vast majority of the market. A likely scenario would be that another dominant company (such as Epic Games) introduces its own app store to bypass Apple's commissions or tight rules.

As described above, possible changes include allowing the presentation of alternate payment methods to lessen heavy fees, changing the revenue model to spread costs among developers, breaking up Apple to restrict self-preferencing, and allowing third-party app stores to increase competition. Despite questions of implementation, these could improve the App Store for all actors without critically harming Apple's overall revenue. By broadening the obligatory point of passage, the power of the App Store is reduced and the power of the other actors in the

network is thus increased, as shown in Figure 8.

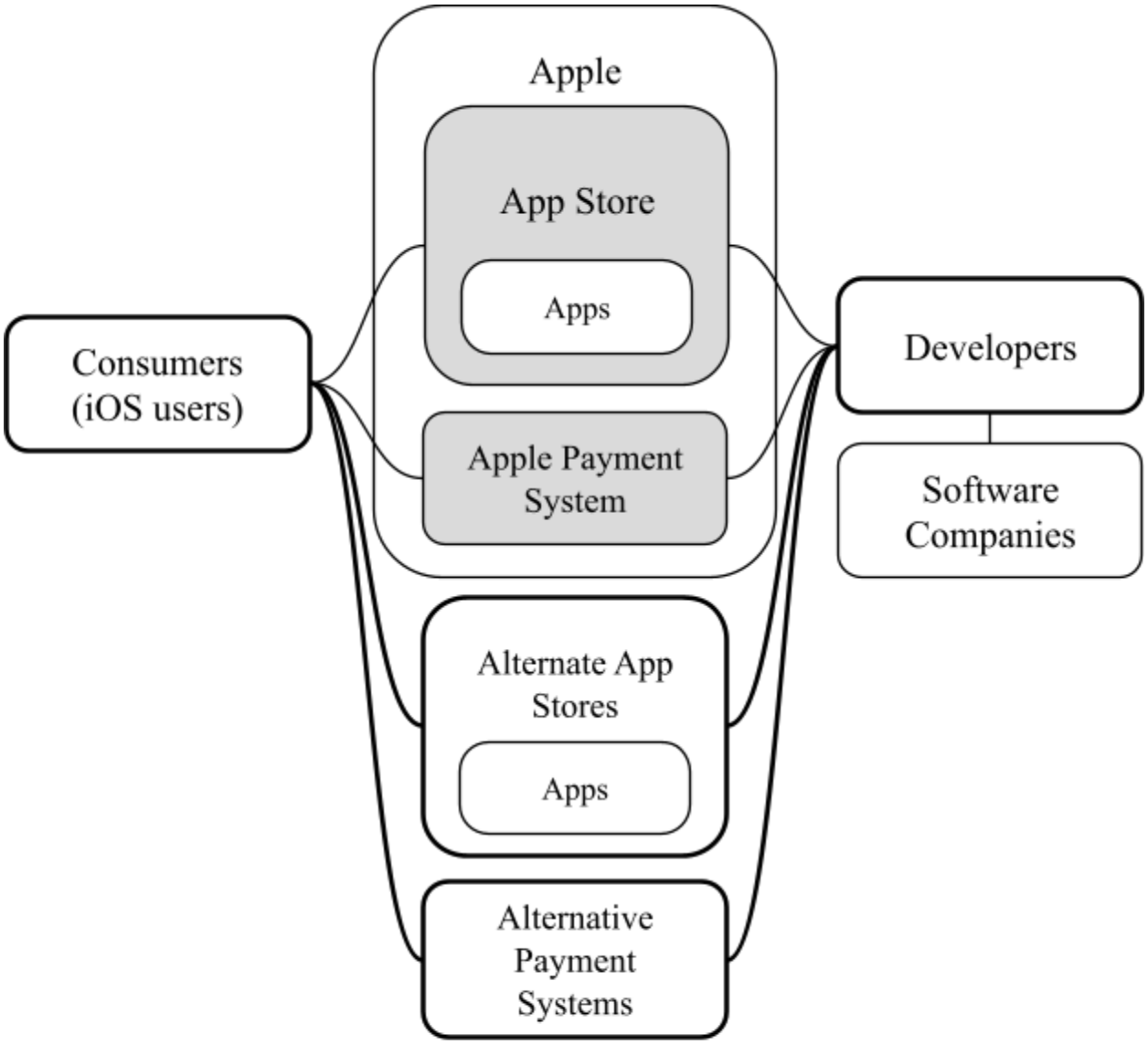

Figure 8. Core actors in the App Store network and their key relationships with hypothetical third-parties involved. As shown, many of the changes proposed, like allowing third-party payment systems or app stores, would reduce the presence of Apple as an OPP and equalize the network.

Conclusion

Because the regulatory world has not yet caught up to the technological one, Apple operates the App Store with increasing scrutiny but few limitations. The results of this work, however, identify multiple features of the App Store that are anti-competitive, including the 30%

commission fee, anti-steering policy, and self-preferencing of apps. In addition, I analyze how recent legal arguments show how Apple's high market power enables these features. Finally, I apply ANT analysis to reinforce how the App Store's power comes from Apple's control of the network by becoming the obligatory point of passage. Regulators should decide how to reduce the power of Apple, and thus give developers and consumers more power, all while maintaining the App Store's appeal of security and privacy. Many of the regulatory possibilities require legal justifications, which are challenging to capture in high-level research and sociotechnical analysis. This makes it difficult to claim definitively what policymakers can do. However, since this paper builds off of existing legal decisions, the legal rationales approach what may be decided in the future. Because of this, the foundation for future policy iteration is sound.

Another consideration is if the consumers, or iOS users, actually want changes to be made. Many of the concerns voiced about the App Store come from large corporations with myriad financial incentives, like Epic Games and Spotify. Apple argues that users are satisfied with the App Store or else they would leave the platform. However, the walled-garden nature of Apple's products and platform creates artificial constraints on consumer choice.

To overcome the limitations of the App Store that consumers are forced to use, regulators should consider multiple changes as described in this paper. These changes include prohibiting anti-steering, forcing a change in revenue model, or requiring the approval of competitor stores. This could reduce app prices and offer a greater breadth of app choices for consumers, reducing the walled garden. For developers, it may help them create and distribute apps accessibly and affordably. Overall, this work highlights the excess power of the App Store, shows how it is used to the detriment of its users, and proposes solutions for balancing actor power in the network.

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