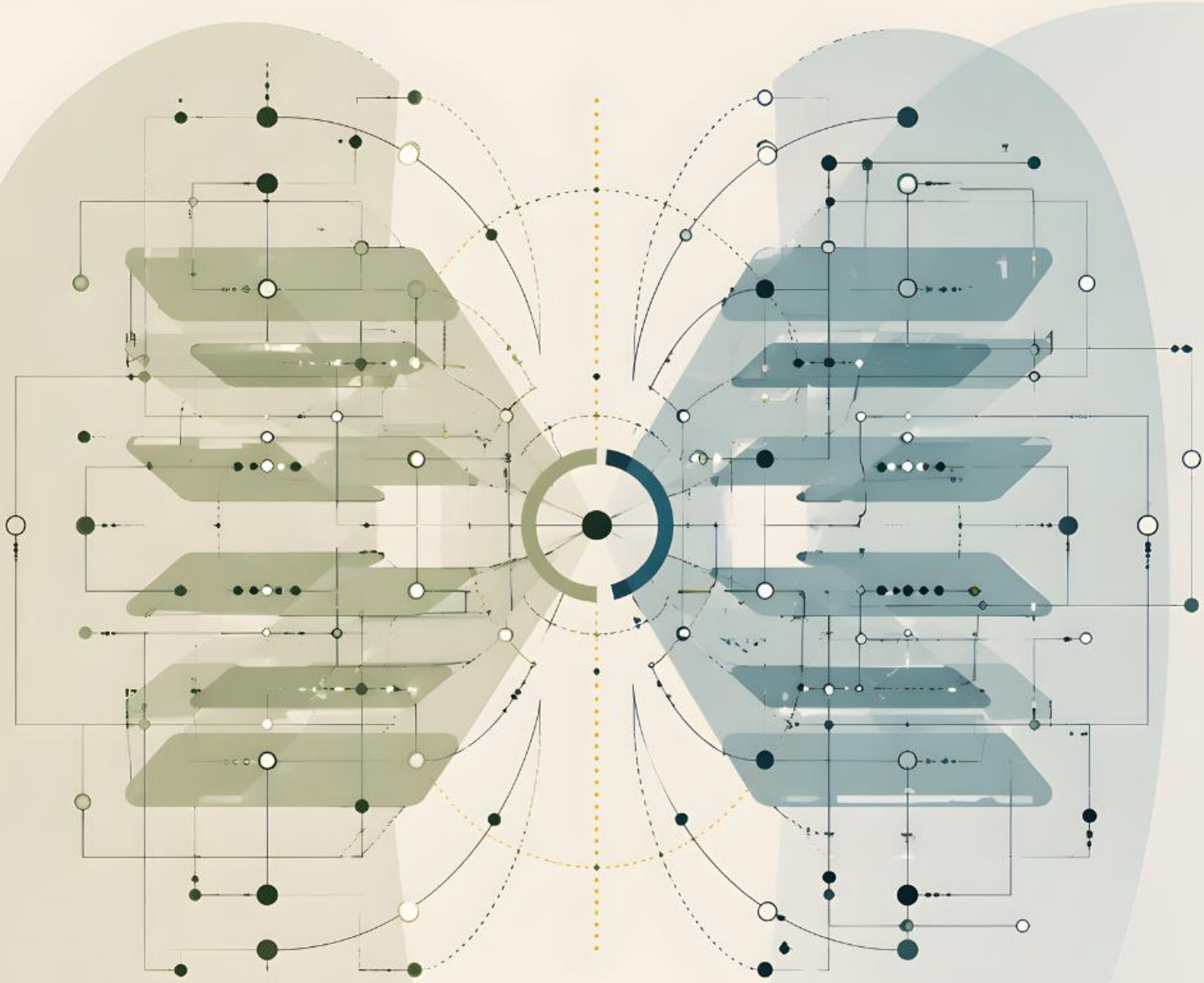
COMPETITION *in* DIGITAL ECOSYSTEMS OF MOBILE DEVICES

COMPETITIVE TRADE-OFFS IN MOBILE DEVICE OPERATING SYSTEMS: CONSIDERATIONS ON INTRA- AND INTER-ECOSYSTEM COMPETITIVE ARRANGEMENTS



SUBMISSION TO THE
COMPETITION AND MARKETS AUTHORITY
CALL FOR EVIDENCE

Legal Wings
institute

About Legal Wings Institute

Legal Wings Institute is a Brazil-based research and advocacy organization dedicated to the legal, regulatory, and institutional challenges raised by emerging technologies and the digital economy. Its work focuses particularly on the governance of artificial intelligence, data protection, platform regulation, digital rights, competition in digital markets, and the broader relationship between technological innovation and fundamental rights.

The Institute develops applied legal research, policy analysis, and strategic contributions to public and regulatory debates, with particular attention to the Brazilian and Global South perspectives. Its activities include the production of reports, studies, and recommendations, as well as engagement with academics, civil society, regulators, and market actors on questions involving responsible innovation, democratic governance, inclusion, and accountability in digital environments.

Legal Wings Institute seeks to contribute to the development of legal and policy frameworks that are both innovation-oriented and rights-respecting, helping ensure that technological progress is aligned with public interest, legal certainty, and the protection of vulnerable groups.

I. Justification of the submission and relevance of the Brazilian experience

The Legal Wings Institute respectfully submits this statement to the Competition and Markets Authority (CMA) in response to the Call for Evidence published on April 1, 2026, concerning the app store rules of Apple and Google.

In Brazil, practices relating to app distribution, payment systems, and anti-steering restrictions have already been examined by the country's antitrust authority, the Administrative Council for Economic Defense (Conselho Administrativo de Defesa Econômica, "CADE"), in investigations involving both Apple and Google that resulted in the execution of Cease and Desist Agreements (*Termo de Compromisso de Cessação, "*TCCs")[1].

The express reference to Brazil's experience in the Call for Evidence[2], underscores the relevance of considering this national background in the CMA's assessment. Accordingly, this submission aims to shed light on the Brazilian experience, particularly with respect to steering restrictions and alternative app distribution channels. To that end, it draws on the analysis conducted by CADE and highlights a set of lessons that may help illuminate the competitive effects associated with app store rules.

Therefore, this submission presents the solutions adopted in Brazil and the competitive parameters that informed CADE's approach, with a view to contributing to the comparative analysis being undertaken by the CMA.

II. Scope of the contribution

This submission contributes to the competitive analysis of mobile digital ecosystems structured around the iOS and Android operating systems by offering comparative insights grounded in the Brazilian experience.

Section III explains why the Brazilian market is a useful comparative case, highlighting its comparatively plural structure, lower concentration levels, and broader variety of distribution channels.

Section IV then examines CADE's enforcement practice in the Google Android and Apple App Store cases, showing how the Brazilian authority has addressed these issues through

[1] Under Brazilian competition law, the Cease and Desist Commitment Agreement (TCC), as provided for in Articles 85 and 86 of Law No. 12,529/2011, allows the investigated party to undertake obligations to cease potentially anticompetitive conduct, without any admission of liability. In the United Kingdom, a functionally similar mechanism is that of commitments, provided for in Section 31A of the Competition Act 1998.

[2] As indicated in footnote n. 9 (p. 4) of the Call for Evidence: "*Apple has made similar changes to those described in paragraphs 13 and 14 in relation to steering and alternative app distribution respectively in Brazil*".

negotiated commitments rather than rigid unilateral remedies.

Sections V and VI provide the analytical framework of the submission. Section V explains why mobile ecosystems must be examined through both inter- and intra-ecosystem competitive dynamics and why market definition in this context requires particular caution. Section VI turns to the relationship between orchestrators and complementors, arguing that it is predominantly cooperative and that many platform rules must be assessed in light of their governance functions, economic justifications, and efficiencies.

Section VII applies this framework to the principal forms of conduct under scrutiny, especially anti-steering rules and commissions linked to integrated payment systems, and explains why the Brazilian antitrust tradition calls for caution where intervention would approximate indirect price regulation.

III. Brazilian context of the digital ecosystems market

The Brazilian economic context displays competitive dynamics that differ from those observed in the UK.[3] The Brazilian market presents a fairly distributed structure: Samsung holds approximately 33.06% of the market, followed by Motorola with 20.63%, Apple with 19.33%, and Xiaomi with 15.32%.[4] Although exact figures vary across sources, they consistently place Apple within the 10-20% range[5]. Overall, this distribution reflects a competitive environment, in which several relevant players coexist with relatively similar shares, thereby increasing market contestability.

Another important feature of the Brazilian market is the strong presence of manufacturers linked to Chinese groups, particularly Xiaomi and Motorola, both of which play a central role in the sector. Although these companies rely on the Android operating system, they often adopt customized versions of the platform, which increases flexibility in the design

[3] In the UK, the smartphone market in 2025 showed a high degree of concentration, with Apple leading the segment, followed by Samsung, indicating significant market power concentrated in a limited number of firms. Accessed on 17 April 2026. Available at: https://gs.statcounter.com/vendor-market-share/mobile/united-kingdom.

[4] Accessed on 17 April 2026. Available at: https://gs.statcounter.com/vendor-market-share/mobile/brazil/2025.

[5] In Administrative Proceeding No. 08700.009531/2022-04, in its administrative defense submitted on January 13, 2025, Apple presented various data regarding the market share of mobile operating systems. It argued, based on information provided by third parties, that, according to Bytedance, iOS held 18.6% of the market, compared with Android's 81.08%, in February 2023. Furthermore, it stated that, according to Telegram, in 2022 Android and iOS accounted for the principal shares of the Brazilian market, approximately 85% and 15%, respectively. In the same vein, it emphasized that, according to 99 Táxi, approximately 80% of devices in Brazil used Android, while 20% used iOS. Lastly, it mentioned that Meta, in the context of Administrative Inquiry No. 08700.002940/2019-76, stated that, between 2020 and 2022, Android was present on approximately 81% to 83% of devices, whereas iOS ranged from 12% to 14%.

and operation of their respective ecosystems.[6] This contributes to a market structure in which competitive pressure is shaped not only by the formal existence of the Android/iOS divide, but also by variation within the Android-based segment itself.

Taken together, these features suggest that the Brazilian market combines a broad diversity of manufacturers with a wider plurality of digital distribution channels. This reduces barriers to entry, expands the range of alternatives available to consumers, and may also create more favorable conditions for developers, thereby reinforcing a more competitive and dynamic digital ecosystem.

IV. CADE's enforcement in mobile digital ecosystems in Brazil

In Brazil, the antitrust authority has already examined competition issues arising in mobile digital ecosystems, particularly in the Google Android and Apple App Store cases.

In Administrative Inquiry No. 08700.002940/2019-76 (Google Android case), CADE investigated a set of agreements entered into by Google with mobile device manufacturers and mobile network operators. These included: (i) the AFA/ACC (Anti-Fragmentation Agreement / Android Compatibility Commitment), which establish compatibility requirements for the Android system; (ii) the MADA (Mobile Application Distribution Agreement), which governs the licensing and pre-installation of Google's proprietary applications; and (iii) the RSA(Revenue Share Agreement), which provides for revenue sharing subject to certain commercial conditions. Taken together, these arrangements were considered capable of affecting competitive conditions in the supply of licensable operating systems and related services in the Brazilian market.

In response, the Cease and Desist Agreement[7] No. 08700.007062/2025-23 was executed. Under this agreement, Google undertook, within the scope of the MADA agreements, not to condition the licensing of Google Play on the pre-installation or preferential placement of its search and browser applications. Google also committed not to adopt retaliatory measures, including refusal to deal or commercial restrictions, against manufacturers that choose not to install those applications.

With respect to the RSA agreements, Google further undertook not to condition payments or other economic incentives on the exclusion of competing search services. In addition, it agreed to notify manufacturers and commercial partners and to waive contractual

[6] This flexibility is particularly reflected in the openness to the use of alternative application distribution channels. Xiaomi, for instance, offers, in addition to Google's official store, its own distribution platform, the Mi App Mall, thereby creating an additional competitive environment alongside the App Store. Similarly, Motorola devices, although recommending the use of the official store, do not impose equivalent technical restrictions, allowing greater user freedom regarding the origin of applications.

[7] Cf. Fn. 1.

clauses incompatible with those commitments.

In turn, CADE also examined Apple's conduct in Administrative Proceeding No. 08700.009531/2022-04 (Apple App Store case), which concerned practices in the market for app distribution on iOS devices. The investigation focused, in particular, on the terms and conditions imposed on developers, the distribution of digital goods and services, and the use of payment processing systems for in-app purchases.

In this case as well, a Cease and Desist Agreement[8] was executed under No. 08700.006953/2025-62. Per that agreement, Apple undertook to allow, in Brazil, the distribution of applications through alternative app stores on iOS, subject to eligibility requirements and control mechanisms. Apple also committed to permit developers to use alternative payment processors, provided that Apple's own payment system remains simultaneously available.

In addition, Apple undertook to allow developers to promote external offers through links and other steering mechanisms within applications, again alongside Apple's own payment system, and to implement new commercial terms applicable to digital transactions.

These cases illustrate CADE's preference for a consensual enforcement strategy in digital markets, implemented through the execution of TCCs.[9] This approach, which has become increasingly common in proceedings involving digital markets, reflects a deliberate enforcement choice by CADE to address competition concerns through negotiated commitments. In complex and fast-evolving settings, e.g. involving security, privacy, and user experience considerations, such an approach not only allows for more tailored and technically responsive solutions, but also helps foster greater trust, cooperation, and commitment between the regulator and regulated entities in the implementation of the agreed measures, instead of immediately resorting to the imposition of sanctions or rigid unilateral remedies.[10]

V. On the relationship between ecosystems

Having outlined both CADE's enforcement practice and the main characteristics of the Brazilian market, the analysis now turns to the structural relationships that shape mobile digital ecosystems, as well as to the main competition issues raised in Brazil in this context. The focus here is on the interactions among the various actors that compose these ecosystems and on the competitive implications of their economic organization.

In this regard, the concept of a "digital ecosystem" may be understood as an evolution

[8] Cf. Fn. 1.
[9] Cf. Fn. 1.
[10] Legal Wings, *Regulation of Digital Markets in Brazil: A Critical Analysis of Bill No 4675* (27 March 2026) 80 https://www.legalwings.com.br/_files/ugd/df689d_ca0544da496440d9a1a10b2079b22f7f.pdf accessed 16 April 2026.

of the notion of "digital platforms", i.e., in simplified terms, companies operating in two- or multi-sided markets, through the internet, enabling interaction between distinct and interdependent groups of users.[11] The ecosystem perspective places greater emphasis on the complementarities between "orchestrators" (providers of a technological infrastructure that enables the development of other markets by third parties, such as Apple and Google) and "complementors" (suppliers of complementary products and services operating within such technological infrastructure).[12]

In the case of mobile devices, these ecosystems encompass a chain that includes device manufacturing, the integration of the operating system — internally, in Apple's case, and through licensing, in Google's — app distribution, and a range of related functionalities, such as in-app payment systems.[13] The interaction among these layers is illustrated in the figure below.

[11] European Commission (2015), as cited in ZINGALES, Nicolo; STYLIANOU, Konstantinos. From platforms to digital ecosystems: implications for the definition of market power. In: The application of antitrust law in digital ecosystems: challenges and proposals. Nicolo Zingales, Paula Farani de Azevedo (eds.). Rio de Janeiro: FGV Direito Rio, 2022.

[12] Zingales and Stylianou (n 11).

[13] Adaptation of the Japan Fair Trade Commission (JFTC) classification—defining the smartphone ecosystem in four layers (device, operating system, app store, and applications)—to encompass the functionalities analysed by CADE in the cases mentioned (such as in-app payments, in addition to the applications themselves). Cf: Japan Fair Trade Commission, *Market Study Report on Mobile OS and Mobile App Distribution* (February 2023) https://www.jftc.go.jp/file/230209EN_hontai2.pdf accessed 16 April 2026.

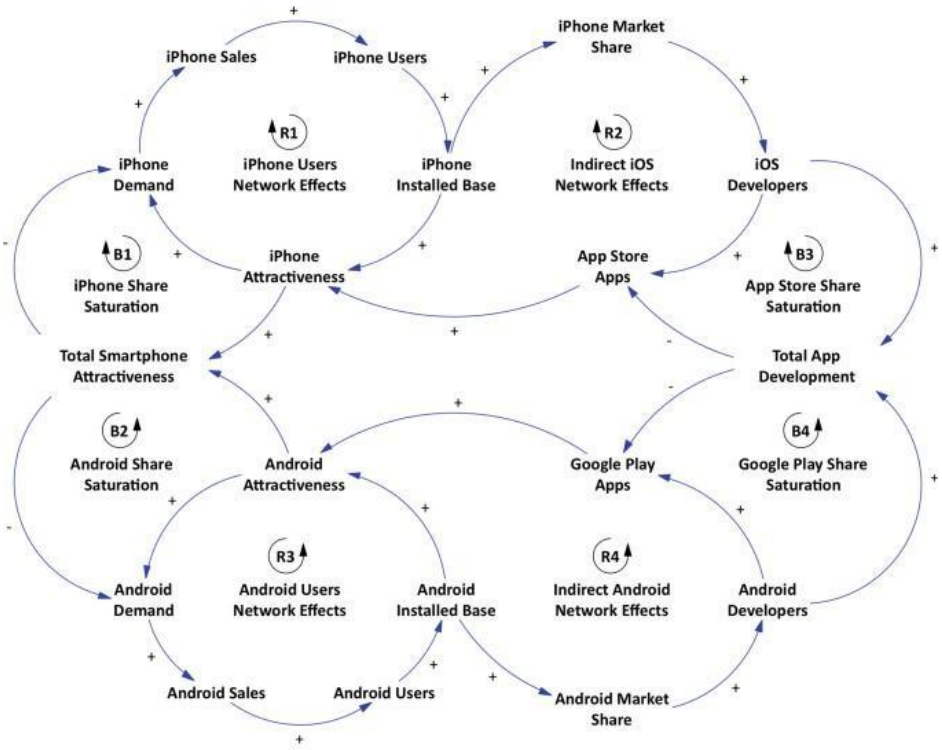


Fig. 1. Smartphone users and developers network effects high-level model

Source: Arzoglou et al (2019).

These layers, however, do not interact only within a given ecosystem. They also interact across ecosystems. In other words, the relevant competitive dynamics are both intra-ecosystem and inter-ecosystem. Significant competitive pressures may arise at each of these stages, generating competition not only among firms operating within the same ecosystem, but also between distinct ecosystems and operating systems.

This broader perspective is reflected in Arzoglou et al. (2019), who developed an economic model of competition between Apple and Google in the smartphone market based on dynamic competition between iOS and Android, simultaneously considering both the user side and the developer side of these ecosystems. Their findings point to the existence of dynamic competition between operating systems — notwithstanding their different licensing models — closely connected to competition in the smartphone market itself. The model further shows that competition in the smartphone market is highly sensitive to factors such as user adoption and app availability, which reflect both direct and indirect network effects.[14]

Beyond the pressures identified in that study, technological evolution itself introduces additional sources of competition. Features that once represented meaningful competitive advantages (e.g. camera quality, processing power, or display performance) have increasingly

[14] E Arzoglou, T Elo and P Nikander, 'The Case of iOS and Android: Applying System Dynamics to Digital Business Platforms' in J Rodrigues and others (eds), *Computational Science – ICCS 2019* (Lecture Notes in Computer Science vol 11540, Springer 2019) https://doi.org/10.1007/978-3-030-22750-0_43.

been matched by competitors.[15] As a result, ecosystems now seek to differentiate themselves through other parameters, such as stronger security and privacy protections,[16] or greater freedom of choice for users in obtaining third-party applications,[17] and for developers in distributing them.[18] This gives rise to an important trade-off between security and privacy, on the one hand, and openness, user choice, and distributional freedom, on the other.

This trade-off is not theoretical. Security and privacy failures generate significant costs,[19] and the growing number of incidents involving mobile devices only reinforces the practical relevance of these concerns.[20]

Therefore, defining the relevant market in mobile digital ecosystems requires particular caution. Any market definition must account for the interaction between intra- and inter-ecosystem dynamics. Brazilian experience[21] suggests that an excessively narrow market definition — such as one that sharply distinguishes between licensable operating systems, like Android, and non-licensable systems, like iOS — may overstate the market power of ecosystem orchestrators. For this reason, careful attention should also be paid to inter-ecosystem competitive pressures, especially those arising from differentiation along dimensions such as security and privacy, on the one hand, and freedom of choice for users and developers, on the other. As the Brazilian cases illustrate, many platform rules and restrictions are directly connected to this trade-off.

Failing to incorporate these dynamics into the competitive analysis may lead to the mistaken characterization of core competitive parameters as anticompetitive conduct. In turn, this creates the risk of intervention in mechanisms that may in fact reflect legitimate forms of

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[15] TudoCelular, 'Real-Size Comparison: Xiaomi 15 and 15 Pro vs iPhone 16 Pro, Galaxy S24 Ultra and Other Rivals' (29 October 2024) https://www.tudocelular.com/tech/noticias/n227809/comparativo-xiaomi15-15-pro-iphone-16-pro-galaxy.html accessed 17 April 2026.

[16] Apple, 'Apple Announces Powerful New Privacy and Security Features' (June 2023) https://www.apple.com/br/newsroom/2023/06/apple-announces-powerful-new-privacy-andsecurity-features/ accessed 17 April 2026.

[17] Android, *Android 10 Compatibility Definition* https://source.android.com/docs/compatibility/10/android-10-cdd?hl=pt-BR#4_application_packa accessed 17 April 2026.

[18] Android Developers, 'Alternative Distribution' https://developer.android.com/distribute/marketing-tools/alternative-distribution?hl=pt-br accessed 17 April 2026.

[19] Estimates suggest that the average cost associated with a data breach is approximately USD 4.88 million. Cf: IBM, *Cost of a Data Breach Report* https://www.ibm.com/reports/data-breach accessed 17 April 2026.

[20] Verizon, 'Cyberattacks on Mobile Devices Are on the Rise' https://www.verizon.com/business/resources/whitepapers/cyberattacks-on-mobile-devices-are-on-the-rise/ accessed 17 April 2026.

[21] As carried out by the General Superintendence in the Google Play Store (Administrative Inquiry No. 08700.009916/2024-25), Google Android (Administrative Inquiry No. 08700.002940/2019-76), and Apple App Store (Administrative Proceeding No. 08700.009531/2022-04) cases.

competition between ecosystems.

VI. Relationships between orchestrators and complementors

Intra-ecosystem relationships display a different dynamic. The digital ecosystems in which Apple's iOS and Google's Android mobile operating systems operate are composed of a range of interconnected services and products linked to distinct digital environments, together delivering an integrated and often personalized experience to consumers. This business model enables significant operational efficiencies and productivity gains[22]. By definition, these are relationships among suppliers operating within a common framework, in which complementors offer products and services across a wide variety of markets, including health, fitness, finance, marketplaces, education, music, and gaming. Within this structure, orchestrators and complementors are mutually dependent, since the presence of developers increases the attractiveness of the ecosystem to users. As a general matter, therefore, this relationship is one of cooperation rather than competition.

That said, orchestrators may also operate at the application layer and, in doing so, compete directly with specific complementors. This is the case, for example, of Apple Music competing with music-streaming applications, or the Google Gemini app competing with AI-based chatbots offered through apps. In such circumstances, the assessment of possible anticompetitive conduct must turn on the definition of the relevant product market for the complementary good or service at issue, since each complement constitutes a market in its own right, with its own players, barriers to entry, market shares, and competitive conditions. The European Commission's Apple App Store case concerning music-streaming applications (Case AT.40437) illustrates this approach, as relevant markets were defined for distinct layers of the ecosystem, including markets for smart mobile devices, platforms for the distribution of streaming applications, and music-streaming services.[23]

The value created by these ecosystems is also appropriated by third parties. From the standpoint of access to mobile applications, the concentration of access in an app store belonging to the relevant digital ecosystem allows users to locate programs and applications compatible with the operating system in a simpler and more reliable manner.[24] In this sense,

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[22] MIT Technology Review, 'The Tangible Value of Digital Ecosystems in Business' https://mittechreview.com.br/o-valor-tangivel-dos-ecossistemas-digitais-nos-negocios/ accessed 17 April 2026.

[23] European Commission, *Commission Decision of 4 March 2024 relating to a proceeding under Article 102 of the Treaty on the Functioning of the European Union and Article 54 of the EEA Agreement (Case AT.40437 – Apple – App Store Practices (music streaming))* (4 March 2024) 74–154 https://ec.europa.eu/competition/antitrust/cases1/202419/AT_40437_10026012_3547_4.pdf accessed 17 April 2026.

[24] Michael A Cusumano, 'Epic Versus Apple and the Future of App Stores: Seeking a More Equitable Way to Govern and Distribute the Revenues Generated by App-Store Marketplaces' https://dl.acm.org/doi/fullHtml/10.1145/3498659 accessed 17 April 2026.

the digital ecosystem concentrates and connects flows of users and developers through a common digital infrastructure, while also governing that infrastructure through standardized rules relating to access, interface, compatibility, pricing, payment methods, quality, security, and privacy.[25]

To better capture the rationale of this business model and its competitive implications, an analogy may be drawn with shopping centres in the physical world. Shopping centres emerged to concentrate a variety of goods in a single location, particularly in response to population dispersion toward peripheral areas and improvements in transportation systems.[26] Although these developments have diversified over time, they continue to perform the function of connecting customers and retailers through the concentration of products and services in one place. For retailers, they operate as generators of consumer traffic and as platforms for product exposure, in a manner analogous to app distribution within a digital ecosystem. Shopping centres reduce search costs by bringing multiple stores together in a single location, increase traffic to other stores through anchor tenants, and foster cooperation between retailers and the shopping centre itself in pursuit of better outcomes[27].

This similarity also appears in the structural and governance features of shopping centres: (i) a set of stores offers different products and services; (ii) retailers are subject to standardized contractual terms and an operational framework designed to preserve the functionality and integration of the whole; and (iii) rent may be partially linked to tenant revenue.[28] The comparison does not suggest that digital ecosystems and shopping centres are identical phenomena. Rather, it serves as a heuristic[29] to facilitate the antitrust analysis of the rules governing relationships between orchestrators, developers, and users.

This analogy is particularly useful when examining unilateral conduct. In cases involving shopping centre operators and retailers, antitrust scrutiny has often focused on the legality of radius clauses. These clauses are contractual provisions that restrict a retailer from establishing itself in another location within certain geographic, temporal, and material

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[25] *ibid*.

[26] Brazilian Development Bank (BNDES), *BS 26: Shopping Centre Sector in Brazil* (n d) https://web.bndes.gov.br/bib/jspui/bitstream/1408/2575/1/BS%2026%20Setor%20de%20shopping%20center%20no%20Brasil_P.pdf accessed 17 April 2026.

[27] Eric D Gould, B Peter Pashigian and Canice J Prendergast, 'Contracts, Externalities, and Incentives in Shopping Malls' (2005) 87(3) Review of Economics and Statistics 411.

[28] BRAZILIAN DEVELOPMENT BANK (BNDES). BS 20 – Characterization of the Shopping Centre Industry. Rio de Janeiro: BNDES, n.d. Available at: https://web.bndes.gov.br/bib/jspui/bitstream/1408/2659/1/BS%2020%20Caracteriza%c3%a7%c3%a3o%20da%2 0ind%c3%bastria%20de%20shopping_P.pdf. Accessed on 17 April 2026.

[29] Gerd Gigerenzer and Wolfgang Gaissmaier, 'Heuristic Decision Making' (2011) 62 Annual Review of Psychology.

limits[30]. As vertical restraints, radius clauses are not unlawful per se, since they may also generate pro-competitive effects[31], such as enabling lower prices for retailers in exchange for exclusivity, with possible downstream benefits for consumers. Their legality must therefore be assessed under a rule of reason framework, which generally requires: (i) identifying the agent's market power; (ii) examining the economic justifications advanced; and (iii) evaluating the efficiencies associated with the conduct.

In the Brazilian context, CADE's case law has generally regarded radius clauses as lawful where they are justified by the need to protect investments made to ensure the viability of the enterprise and to prevent opportunistic behaviour (free riders) by retailers that seek to benefit from the consumer traffic generated by the shopping centre without contributing proportionately to its creation.[32]

A parallel may therefore be drawn between the relationship of shopping centre operators and retailers, on the one hand, and that of digital ecosystem orchestrators and app developers, on the other. In both settings, there is a centralization of resources resulting from investments in the infrastructure required to establish and maintain the enterprise. Likewise, the concentration of goods and services within a single physical or digital environment generates greater consumer traffic to the ecosystem as a whole, so that each individual participant benefits from the value created by the system and from the infrastructure collectively financed by the participating agents.

From this perspective, restrictions imposed by orchestrators in mobile app ecosystems, such as prohibitions on sideloading or on steering users to complete purchases outside the application and outside the ecosystem, bear some resemblance to restrictions found in shopping centres. A retailer that seeks to operate in a shopping centre must comply with requirements relating to safety, layout, façade design, quality control, and customer service, so as not to compromise the quality, reputation, and collective traffic-generating function of the shopping centre. A similar logic may be invoked to explain restrictions on sideloading and the quality, security, and oversight policies implemented by ecosystem orchestrators in relation to applications.

The evolution of digital ecosystems has transformed mobile devices operating on iOS and Android into strategic commercial spaces, comparable to showcases that expand

[30] Definition presented by Commissioner João Paulo de Resende in the context of Administrative Proceeding No. 08012.007423/2006-27. Complainant: Della Vita Grande Rio Indústria e Comércio de Produtos Alimentícios Ltda. Respondents: Unilever Brasil Ltda. and Nestlé Brasil Ltda. Reporting Commissioner: João Paulo de Resende (SEI 0538246).

[31] G Frank Mathewson and Ralph A Winter, 'The Competitive Effects of Vertical Agreements: Comment' (1987) 77(5) The American Economic Review 1057.

[32] See considerations to this effect in Administrative Proceeding No. 08012.002841/2001-13, as set out by Reporting Commissioner Roberto Augusto Castellanos Pfeiffer; and in Administrative Proceeding No. 08700.004938/2014-27, in Technical Note No. 6/2016/SG.

business opportunities. These environments are no longer merely sales channels. They are robust and structured platforms that enable exposure to specific user segments and create continuous flows of access to end users generated by the ecosystem itself.

In this context, the relationship between orchestrators and complementors is best understood as predominantly cooperative. The imposition of operational rules and conditions for access to the infrastructure does not, in itself, indicate anticompetitive unlawfulness. Rather, such rules are inherent to the organization, economic viability, and differentiation of each ecosystem.

The Brazilian experience supports this understanding. Antitrust analysis has recognized that such restrictions must be assessed in light of their economic justifications and the efficiencies they may generate, especially in contexts involving significant investments in infrastructure, security, and service quality. In this respect, decisional practice has been guided by a rule of reason approach, under which the identification of a possible anticompetitive infringement depends on balancing restrictive effects against the justifications and efficiencies associated with the conduct.

Accordingly, these relationships should be examined with particular caution, so as to distinguish genuinely exclusionary conduct from legitimate mechanisms of coordination and governance. Otherwise, there is a risk of interventions that may impair the functioning of the ecosystem and undermine the benefits it generates for both users and developers.

VII. Potentially anticompetitive conduct in ecosystems in which operating systems are embedded

Antitrust investigations concerning the iOS and Android operating systems have primarily focused on two categories of conduct: (i) anti-steering rules affecting the distribution of applications and the use of external payment systems; and (ii) the commissions charged on transactions carried out through payment systems integrated into the digital ecosystem.

With respect to anti-steering rules, their justification may be understood, at least in part, as a means of preventing opportunistic behavior, in a manner analogous to radius clauses in shopping centres. Digital ecosystems require significant investments, reflected in the operational costs associated with maintaining a secure and reliable environment that complies with applicable technical and commercial standards. These ecosystems invest in infrastructure, governance, and technical support that enable developers, regardless of their size, to meet those standards, thereby ensuring coordinated operation among the different participants and preserving the overall value generated by the ecosystem. The costs of this structure are generally recouped through transactions involving digital goods and services, functioning as consideration for access to a high-quality platform that adds value through security, reliability, and a consistent user experience. The reputation of the ecosystem itself, particularly in terms

of quality and security, also forms part of the value from which applications benefit and for which remuneration may be justified.

At the same time, the restrictions imposed within these ecosystems are not uniform. They vary according to the nature and profile of the application and are often presented as mechanisms designed both to prevent abusive behavior and to preserve an environment that promotes user access and transactional security. By way of illustration, commissions are charged only on applications that distribute digital goods and services. Within Apple's ecosystem, only 16% of applications are subject to such commission[33], while in Google's ecosystem the figure is 3%.[34] In this sense, anti-steering rules may be seen as serving not only to preserve the expenditures required to maintain the ecosystem's infrastructure, but also a redistributive function, insofar as they enable smaller developers to benefit from the ecosystem on the basis of commissions paid by larger participants. Likewise, restrictions on sideloading may help preserve the reputation of the ecosystem as a whole, since end users often attribute failures such as fraud, payment problems, or malware not to a particular source, but to the overall quality and trustworthiness of the system.

By benefiting from a structured and secure platform, developers are not merely distributing a product or service; they are integrating into an environment that increases the visibility, accessibility, and reach of their applications. Accordingly, restrictions aimed at ensuring compliance with the ecosystem may be understood as preserving the standards that attract and retain end users in the first place.

In this sense, digital ecosystems offer developers access to a broad user base and to a highly organized commercial environment, in which the investments made in maintenance, governance, and security help explain the costs and restrictions imposed. Much like a shopping centre that invests in infrastructure and security in order to attract consumers and benefit the collective enterprise, digital ecosystems impose certain restrictions in order to preserve the quality, reliability, and attractiveness of the services made available within them.

Once the possible justifications and efficiencies associated with these practices are taken into account, the central issue may ultimately narrow to the commissions charged for payment processing. The analysis of this aspect could, in principle, be framed through methodologies associated with theories of exploitative abuse, as has occurred in other

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[33] Statement of Kyle Andeer, U.S. House of Representatives Judiciary Committee, Subcommittee on Antitrust, Commercial, and Administrative Law. Hearing on "Online Platforms and Market Power, Part 2: Innovation and Entrepreneurship." Available at: https://docs.house.gov/meetings/JU/JU05/20190716/109793/HHRG-116-JU05-WstateAndeerK20190716.pdf. Accessed on 17 April 2026.

[34] Google, 'Google Play Service Fees' https://support.google.com/googleplay/androiddeveloper/answer/112622?hl=en accessed 17 April 2026.

jurisdictions, such as before the Netherlands Authority for Consumers and Markets.[35] Yet such an approach encounters an important limitation in Brazil: Brazilian antitrust law does not recognize a doctrine of exploitative abuse, nor does it attribute to the competition authority a general role in price regulation.

Indeed, in cases involving allegations of excessive or discriminatory pricing, CADE has generally limited itself to examining the economic rationale and competitive effects of the conduct, rather than imposing any direct form of price control. This position is reflected in a recent decision[36] for container segregation and delivery services, known as Terminal Handling Charge 2 (THC2), or the fee for container segregation and delivery services (SSE). In that case, Reporting Commissioner Luiz Hofmann recalled that, during the legislative debates surrounding the enactment of the law structuring the Brazilian Competition Defense System, the express reference to excessive pricing as an infringement was ultimately removed on the grounds that it would be inappropriate to assign CADE the role of a "price sheriff," a function considered foreign to the purpose of competition law, which is to promote economic efficiency[37].

In light of this, Brazilian antitrust analysis of pricing-related practices in digital ecosystems has not focused on price levels as such, but rather on whether pricing may be linked to exclusionary conduct and generate anticompetitive effects. From this perspective, the assessment remains guided by the rule of reason and depends on demonstrating negative competitive impacts resulting from the exercise of market power.

This framework calls for caution in relation to interventions that may, in practice, amount to an indirect form of price regulation, particularly where commissions and related transactional rules are integral to the economic structure of the ecosystem. Intervening in those mechanisms may affect the operational logic of the system itself and move antitrust analysis closer to a form of regulation of exploitative abuse, which, as a rule, falls outside the Brazilian antitrust tradition.

Conclusion

In light of the foregoing, the relationships within the digital ecosystems in which the iOS and Android operating systems are embedded require careful and context-sensitive analysis, so as to avoid mischaracterizing the competitive dynamics at stake. Such mischaracterizations may lead both to false positives — for example, by overlooking

[35] Inge Graef, 'What the Dutch Apple Case Can Teach Us About Future Challenges for Competition Enforcement' (2022) 10(3) Journal of Antitrust Enforcement 570 https://academic.oup.com/antitrust/article-abstract/10/3/570/6697918 accessed 17 April 2026.
[36] Administrative Proceeding No 08700.005499/2015-51, Tecon Suape SA (3 February 2021) Reporting Commissioner Luiz Augusto Azevedo de Almeida Hoffmann.
[37] Opinion of the Reporting Commissioner Luiz Augusto Azevedo de Almeida Hoffmann, para. 352 (SEI Doc. 0864149).

competition between Apple and Google at the operating system and app distribution levels — and to false negatives, by too readily assuming that orchestrators compete with complementors across digital ecosystems as a whole.

A more precise understanding of these relationships also helps identify the forms of potentially anticompetitive conduct that may genuinely arise within such ecosystems. Drawing on the analogy between the relationship of app stores and developers, on the one hand, and shopping centres and retailers, on the other, it becomes possible to see these arrangements primarily as forms of cooperation governed by specific rules, often supported by efficiencies and legitimate business justifications, including the reduction of consumer search costs and investments in infrastructure and security. On this view, the main area in which antitrust concerns may more plausibly arise relates to the commissions charged for payment processing. However, even this issue poses important analytical limits in the Brazilian context, since its assessment would tend to rely on theories of exploitative abuse, a category that is not recognized within Brazilian antitrust tradition, which also does not assign the competition authority any general role in price regulation.

Finally, the Brazilian experience shows that, given the complexity of these markets, the antitrust authority has favored negotiated solutions. In the cases involving Apple and Google, CADE opted for the execution of Cease and Desist Agreements, through which obligations were established concerning, for example, the prohibition of tying practices, the possibility of alternative app distribution, and the use of different payment methods. This reflects a pragmatic and calibrated approach to competition enforcement, one that seeks to address competitive concerns without immediate resort to rigid unilateral remedies.

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