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Vertical interoperability in mobile ecosystems: Will the DMA deliver (what competition law could not)?☆

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ABSTRACT

To address concerns about the competitive dynamics of digital markets, the promotion of interoperability has been often pointed out as a fundamental component of policy reform agendas. In the case of mobile ecosystems, the smooth and seamless availability of interoperability features is crucial as third-party devices and apps would be otherwise unable to effectively work and participate within the ecosystems. However, access to application programming interfaces (APIs) may be restricted due to privacy, security, or technical constraints. Further, an ecosystem orchestrator may misuse its rule-setting role to pursue anticompetitive goals by restricting or degrading interoperability for third-party services and devices. The paper aims at investigating whether and how effective interoperability could be achieved through the enforcement of competition rules or whether it would require regulatory interventions, such as those envisaged in the European Digital Markets Act (DMA).

1. Introduction

Over the past two decades, the role and functionalities of mobile phones have undergone a significant evolution. If they primarily serve as the gateway for accessing a plethora of digital content and services, in the wake of the rapid adoption of the Internet of Things (IoT) their market expansion also encompasses new complementary products and services, like home devices, voice assistants, smartwatches, fitness trackers, and other wearables. Hence, mobile devices have arguably become the foremost technological platform in our modern era and exemplify the pinnacle of multi-product ecosystems comprising hardware products and software services which interconnect and synergize, enhancing the value and functionality of each other. As a consequence, competition and innovation within mobile ecosystems have extensive ripple effects that resonate throughout the entire economy.

It is therefore not surprising that mobile ecosystems have been the focus of numerous market studies (Japanese Fair Trade Commission, 2023; U.S. Department of Commerce, 2023; UK Competition and Markets Authority, 2022; Australian Competition and Consumer Commission, 2021), antitrust investigations, and legislative initiatives aimed at addressing relevant competitive concerns (Borgogno and Colangelo, 2022).[1] Indeed, despite a complex and layered structure consisting of devices, operating systems, and applications, mobile ecosystems are currently an oligopolistic market where two players (i.e., Apple and Google) own a gatekeeping position, being responsible for the leading mobile operating systems (iOS and Android), app stores (App Store and Google Play), and web browsers (Safari and Chrome). Because of such a strategic market status and their vertically integrated value chain, Apple

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[1] For the most recent antitrust decision, see European Commission, Decision 4 March 2024, Case AT.40437, *Apple – App Store Practices (music streaming)*, https://competition-cases.ec.europa.eu/search?search= 40437&sortField=relevance&sortOrder=DESC.

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and Google control access to mobile ecosystems, setting rules for (end and business) users, and compete with business users operating on their platforms. As a result, significant competitive concerns have been raised about the risk that Apple and Google may exploit their position by imposing unfair terms and conditions, excluding rivals limiting access to functionalities or making it more burdensome, and adopting practices aimed at providing a preferential treatment to their own (first-party) products and services vis-à-vis alternative (third-party) ones.

Against this background, legislative initiatives have been envisaged to ensure a level playing field by imposing a platform and device neutrality regime.[2] Notably, with the aim of increasing contestability, facilitating the possibility of switching by users, tackling conflicts of interests, and addressing imbalances in business relationships, such interventions include a vast array of provisions concerning self-preferencing, sherlocking, app un-installing, sideloading, app switching, access to technical functionality, default settings, unfair access conditions, data portability, and interoperability.

In general, the push for regulatory measures arises from the challenges faced by antitrust enforcers in addressing enforcement shortcomings (Cappai and Colangelo, 2021). In the case of digital markets, antitrust efforts are perceived as inadequate, primarily because competition rules apply *ex post* and necessitate thorough case-by-case investigations. Moreover, with specific regards to interoperability, competition law may result ill-suited to deliver such a policy goal. Indeed, mandating interoperability under antitrust rules implies considering the platform at issue an essential facility, whose doctrine is not available in every jurisdiction and whose requirements are not necessarily easy to satisfy. Further, the successful application of the essential facility doctrine (EFD) would require competition authorities to perform the challenging task of carrying out the technical implementation of the measure, thus acting as central planners to a given market.

However, interoperability plays a crucial role in mobile ecosystems as well as, in general, in IoT environments (European Commission, 2022; OECD, 2021). Indeed, as these ecosystems are networks comprising tangible and digital elements interconnected seamlessly, without smooth interoperability any device is prone to lose a significant portion of its usefulness. In turn, the benefits arising from these digital ecosystems are maximized by the complementary nature of interoperability solutions. Notably, by allowing products and services provided by different manufacturers to work together in a complementary fashion, protocol interoperability allows third-party devices and services to compete on equal footing with first-party offers that already benefit from superior levels of interoperability because of their technological integration (Berg, 2024; Scott Morton et al., 2023; Bourreau, Krämer, 2023; Crémer, de Montjoye, and Schweitzer, 2019). In other words, this form of vertical interoperability promotes competition within an ecosystem enabling downstream integration across the value chain between complementary products as well as within a digital infrastructure provided upstream.

In such a scenario, the European Digital Markets Act (DMA) stands out as the prime example of the regulatory trend in digital markets, aspiring to be a benchmark for other countries.[3] With specific regard to vertical interoperability in mobile ecosystems, the DMA envisages obligations to install third-party app stores and sideload apps, and to ensure access to essential functionalities of operating systems or hardware capabilities of a given device.[4] Corresponding to the European Commission (EC)'s first enforcement actions, restoring the competitive conditions in the app environment is set as an enforcement priority to ensure the DMA's main objectives.[5]

As *ex ante* interventions are expected to address the antitrust enforcement failure, the paper will investigate whether the DMA will likely be able to deliver effective, smooth, and seamless interoperability in mobile ecosystems. Notably, looking at the compliance reports recently submitted by designated gatekeepers,[6] our analysis will focus on technical implementations and changes to the business model set forth by Apple to meet the DMA's requirements regarding vertical interoperability. Because of the differences between Google's and Apple's business models and conditions for accessing their mobile ecosystems, the latter is expected to be more affected by the new regulation. Indeed, Apple's mobile ecosystem is traditionally described as a walled garden because of its tightly integrated and closed architecture.[7] Therefore, the application of the DMA's vertical interoperability obligations is prone to transform the iOS environment to a larger extent than for Android.

In this regard, two distinct spheres of action must be distinguished.

The first one involves the transformation of Apple's mobile ecosystem from the viewpoint of its iOS ecosystem. As the EC declared when designating Apple as a gatekeeper, those transformations encompass iOS running on iPhones, but not on other types of devices. In other words, vertical interoperability solutions will apply on iOS regarding third-party hardware and software, but do not touch upon Apple's suite of devices, such as its macOS, watchOS, or tvOS.[8] Stemming from the EC's most recent designation, vertical interoperability solutions will also apply to Apple's iPadOS (European Commission, 2024b).

The second line of intervention regards the changes triggered by the DMA's application on Apple's App Store. As opposed to iOS, Apple's technical solutions proposed with regard to its software application store bear an impact on the different versions of the App Store on the gatekeeper's suite of devices. In other words, the App Store version of iOS, iPadOS, macOS, watchOS, and tvOS are all affected by those obligations directed at targeting software application stores.

The paper is structured as follows. Section 2 analyses the role of interoperability in mobile ecosystems. Section 3 investigates whether such an effective interoperability might be achieved through the enforcement of competition rules. Section 4 illustrates the vertical interoperability obligations introduced in the DMA and assesses potential expected results by analysing the solutions advanced by Apple in its compliance report. Section 5 concludes.

2. The role of interoperability in mobile ecosystems

To tackle concerns about the competitive dynamics of digital markets, the promotion of interoperability has often been pointed out as a fundamental component of policy reform agendas (Scott Morton et al., 2023; OECD, 2021; Crémer, de Montjoye, and Schweitzer, 2019). Indeed, as a result of extreme scale economies, strong network effects, lock-in effects, vertical integration, and the lack of multi-homing, these

[2] For the most recent legislative initiative, see Japanese Fair Trade Commission (2024).

[3] Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act), [2022] OJ L 265/1.

[4] Digital Markets Act, Article 6(4) and (7).

[5] See European Commission (2024a) opening its first non-compliance procedures by focusing on Google's and Apple's implementation of the anti-steering prohibition relating to their apps via link-outs and triggering other investigatory powers regarding Apple's proposed terms and conditions to open its closed ecosystem of app distribution.

[6] Gatekeepers' compliance reports are available at https://digital-markets-act-cases.ec.europa.eu/reports/compliance-reports.

[7] For an analysis of the differences between Apple's and Google's mobile ecosystems, see, e.g., European Commission (Case AT.40437, *Apple – App Store Practices (music streaming)*, §§97–104), UK Competition and Markets Authority (2022, 19–27), and U.S. Department of Commerce (2023, 9).

[8] European Commission, Decision 5 September 2023, C(2023) 6100 final, §87.

markets are populated by a small number of large platforms enjoying a gatekeeping position being essential gateways for connecting business users to consumers. In such a scenario, digital gatekeepers exert exclusive control over their platforms, setting terms and conditions for access and use, and they usually also play a dual role, acting as providers of products and services in competition with those of their business guests.[9] As these platforms are linked with conglomerate/ecosystem-based business models, concerns have been raised about strategies that would allow them to grant preferential treatment to their own products and services vis-à-vis third-party ones with the aim of excluding or impeding rivals from competing with the platform (defensive leveraging) and/or extending their market power into associated markets (offensive leveraging).

Against this background, interoperability is deemed to have the potential to foster both inter-platform and intra-platform competition by reducing entry barriers and allowing consumers to multi-home, thus enabling a greater number of firms to enter the market as well as enhancing contestability in complementary markets.

From this perspective, it is worth distinguishing between horizontal and vertical interoperability depending on whether interoperability is expected to promote competition among platforms, by allowing users to preserve network effects on new services, and within platforms, by allowing users to combine various complementary services from different providers.

The debate over horizontal versus vertical interoperability has become a central issue in competition policy for digital markets (OECD, 2021). Specifically, whether horizontal interoperability is the appropriate regulatory approach to ensure effective data sharing and foster technological innovation remains contentious.

A strand of economic literature argues that, assuming interoperability enhances network effects for all players, it can help level the playing field between smaller and larger players, thereby boosting contestability and competition (Crémer, Rey, and Tirole, 2000). Additionally, it has been suggested that interoperability obligations are essential to mitigate economic risks associated with firm-specific network effects, such as lock-in dynamics and market tipping (Scott Morton et al., 2023).

Conversely, some argue that interoperability and multi-homing may serve as alternative methods to enhance competition and improve contestability in digital markets (Bourreau, 2022). As a result, mandating horizontal interoperability could have mixed effects on competition (Busch et al., 2022). Specifically, by promoting homogenization, it may limit differentiation and innovation opportunities; thus, requiring horizontal interoperability might reduce existing incentives for multi-homing and, in the long run, impair competition (Bourreau and Kräemer, 2023). Furthermore, horizontal interoperability requirements could allow dominant firms to exploit a low-barrier, frictionless environment, ultimately reinforcing their monopoly power (Awrey and Macey, 2022). Additionally, if multi-homing is feasible at minimal cost, the potential welfare benefits of horizontal interoperability obligations diminish in fast-evolving digital markets (Bourreau et al., 2022). Finally, compelling firms that have already developed their own services to implement new horizontal interoperability standards would be costly, complex, and time-intensive, posing significant challenges for regulatory monitoring and enforcement (Bourreau, 2022).

Vertical interoperability, instead, promotes complementary innovation and the modular combination of services across the value chain allowing complementors to access the ecosystem and compete for end users by exchanging data and functionalities via application programming interfaces (APIs). In the case of mobile ecosystems, the capability to interconnect and communicate with diverse components is essential for fully deploying the functionalities provided to consumers. However, access to APIs may frequently be restricted due to privacy, security, or technical constraints aimed at preventing degradation of the platform's functionality. Further, an ecosystem orchestrator may misuse its rule-setting role to pursue anticompetitive goals by restricting or degrading interoperability for third-party services and devices, thus limiting their functionalities vis-à-vis its own (Australian Competition and Consumer Commission, 2023).

Within multi-product ecosystems, mobile ones show significant potential technical and behavioral barriers that may affect switching rates, thus reducing the competitive threat to Apple's and Google's mobile ecosystems and weakening the competitive constraint each ecosystem has on each other. Notably, users may face barriers to switching between mobile devices with different operating systems because of learning costs associated with switching mobile ecosystem, transferring data and apps across devices, managing subscriptions across devices, and the differences in the availability and characteristics of Apple's and Google's first-party apps, services, and the rest of their related devices (UK Competition and Markets Authority, 2022).

In other words, smartphones usually serve as entry points leading to subsequent choices, as consumers navigate through a series of interconnected ("nested") decisions (Australian Competition and Consumer Commission, 2023; Fletcher, 2020). When choosing between an iPhone and an Android, consumers weigh in various factors. Yet, once that initial decision is made, subsequent choices become intertwined with it. Behavioral factors like the status quo or default biases reinforce this interconnection. As a result, once a customer adopts a variety of services within an ecosystem provided by a single entity, transitioning away from them can pose a real challenge.

Against this backdrop, the smooth and seamless availability of interoperability features appears crucial to promote intra-platform competition as third-party devices and apps would be otherwise unable to effectively work and participate within mobile ecosystems.

Next Sections will address whether an equitable and effective interoperability could be achieved through the enforcement of competition rules or whether it would require regulatory interventions, such as those envisaged by European policy makers under the DMA.

3. Vertical interoperability under EU antitrust rules

In the last few years, several antitrust disputes and investigations have targeted a vast array of practices and strategies adopted by gatekeepers within the governance policies of their mobile ecosystems, which may create frictions with third-party producers and developers. Notably, competition law enforcers have been dealing with commission fees, anti-steering provisions, the denial of access to technical features (e.g., the near-field communication - NFC) as well as to operating systems, via the removal or rejection of apps following app store review processes and the expulsion of app developers from app stores (Borgogno and Colangelo, 2022).

For instance, in one of the most recent case, the U.S. Department of Justice (DoJ), joined by sixteen other state and district attorneys general, filed a civil antitrust lawsuit against Apple, complaining, among other things, that the latter uses its control of the iPhone (including its technical and contractual control of critical APIs) to degrade the functionality of third-party cross-platform smartwatches.[10] The concern is that the degradation of interoperability would drive consumers towards purchasing first-party products (i.e., Apple Watches) and also discourage consumers from switching from iPhones to other smartphones. According to the complaint, Apple pursues this strategy in at least three significant ways, that is, by depriving iPhone users with third-party smartwatches of the ability to respond to notifications, inhibiting third-party smartwatches from maintaining a reliable connection with

[9] With specific regards to mobile ecosystems, see UK Competition and Markets Authority (2022, pp. 18–19).

[10] *United States of America et al. v. Apple*, Case 2:24-cv-04055 (D.N.J. 2024), §100.

the iPhone, and undermining the performance of third-party smartwatches connecting directly with a cellular network.

Focusing on the European landscape, this Section will review relevant theories of harm and scenarios to investigate whether effective interoperability may be ensured by enforcing competition rules. From the outset, two different hypotheses need to be disentangled. Namely, it is important to separate the scenarios surrounding the pure denial of interoperability as opposed to interoperability degradation. While the latter describes all the cases in which interoperability, albeit granted, is limited and undermined by the gatekeeper because of technical and contractual restrictions, the former includes the denial of the installation of apps or app stores, the refusal to grant third-party services and products access to a device's hardware or software features, and also potentially the refusal to develop new features or adapt current ones in order to meet interoperability requests.

Both scenarios often reflect a self-preferencing strategy as the gatekeeper of a mobile ecosystem may be incentivized to deny or degrade access with the aim of restricting competition by ensuring a preferential treatment to its own products and services (Motta, 2023). Further, in both scenarios, competition law is more comfortable dealing with contractual than technical restrictions.

If the conduct consists of a refusal to provide interoperability, it could be assessed under the exceptional circumstances of the essential facility doctrine and, in particular, by demonstrating that the platform at issue is indispensable and the refusal would eliminate all competition in an adjacent market.[11] In such a case, for the sake of our analysis, the main reference is represented by the *Microsoft* decision where the EU General Court found that interoperability with Microsoft's data was necessary to rivals for developing improved products with added value.[12]

On the other side, when interoperability degradation stems from contractual terms and conditions, it falls within the category of constructive (or implicit) refusal to supply. This describes situations where the dominant player, instead of outright denying access, achieves a similar effect by imposing unfair conditions that degrade or delay the supply of an input.[13] The goal of this approach is to limit the applicability of the essential facility doctrine's criteria merely to cases involving a clear and explicit refusal. Further, since the category of constructive refusal is potentially broad, the very same practice can be also evaluated under other theories of harm, such as discrimination, margin squeeze, unfair terms and conditions, excessive pricing, tying or bundling.[14] Such flexibility for antitrust enforcers is confirmed by the EC's recent decision finding an abuse of Apple's dominant position in the music streaming market.[15] The case was originally framed as exclusionary in nature, but the EC finally decided, by reconvening via an additional statement of objections, to reshape the abuse as an exploitative one (European Commission, 2024c, 2023, 2021).

When the lack or limitation of interoperability does not derive from contractual but from technical restrictions, relevant legal and practical issues emerge. The antitrust assessment and implementation of remedies is more challenging insofar as the competition authorities are directly compelled to fine-tune the product's technical design.

From a legal standpoint, a distinction should be drawn between those cases in which competitive advantages deriving from superior levels of interoperability are linked to technological integration and the distinct scenario in which such restrictions to interoperability are justified for business, security, and/or privacy reasons.

The former scenario can be evaluated as both a form of refusal to deal and tying. While the refusal to deal claim would be assessed under the already mentioned requirements of the essential facility doctrine, the tie-in claim would, as a matter of fact, require satisfying the separate-products test.[16]

In the latter scenario, instead, antitrust enforcers should investigate if access restrictions are necessary and proportionate for the protection of the aforementioned interests. As discussed further below (see Section 4.3), the DMA permits gatekeepers to implement measures that are strictly necessary and proportionate to protect the integrity of hardware or operating systems and ensure end-user security, as long as these measures are properly justified. Under EU competition law, the scope of objective justifications is broader. Indeed, where a competition authority demonstrates that a dominant undertaking's practice has the potential to impair competition, the undertaking can still argue that the practice should not be considered an abuse of dominance by showing that the practice is objectively justified, either by specific circumstances external to the undertaking or by the interests of consumers.[17] For instance, in *Google Shopping*, the General Court stated that the objective necessity may stem from legitimate commercial considerations (e.g., to protect against unfair competition or to take account of negotiations with customers) and from technical justifications (e.g., to maintain product or service performance or to improve performance).[18]

Whereas EU competition law is, at least in principle, equipped to deal with anticompetitive vertical foreclosure strategies pursued through limits on interoperability with third-party services, the concrete implementation of remedial measures appears nonetheless troublesome. Indeed, as summarized in Table 1, the immediate consequence of a successful investigation of a gatekeeper's interoperability approach is to engage in product engineering.

[11] See CJEU, 26 November 1998, Case C-7/97, *Oscar Bronner GmbH & Co. KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co. KG, Mediaprint Zeitungsvertriebsgesellschaft mbH & Co. KG and Mediaprint Anzei- gengesellschaft mbH & Co. KG,* EU:C:1998:569, stating that access to an input is considered indispensable if there are no technical, legal or economic obstacles capable of making it impossible, or even unreasonably difficult, to duplicate it. However, see CJEU, 12 January 2023, Case C-42/21 P, *Lietuvos geležinkeliai AB v. European Commission*, EU:C:2023:12; CJEU, 25 March 2021, Case C-165/19 P, *Slovak Telekom a.s. v. Commission,* EU:C:2021:239, stating that the indispensability requirement is not applicable whenever the owner of the facility previously chose to deal with rivals or a regulatory obligation requires it to share the facility.

[12] General Court, 17 September 2007, Case T-201/04, *Microsoft Corp. v. Commission*, EU:T:2007:289.

[13] See, e.g., General Court, 10 November 2021, Case T-612/17, *Google LLC and Alphabet Inc. v. European Commission*, EU:T:2021:763; CJEU, Case C-42/21 P; CJEU, Case C-165/19 P.

[14] See the Opinion of the Advocate General Saugmandsgaard Øe, 9 September 2020, Cases C-152/19 P and C-165/19 P, EU:C:2020:678, §§83–88, questioning the distinction between "categorical" and "implicit" refusal to access arguing that, due to the spuriousness of the latter concept, nearly any abusive practice may in some way constitute an implicit refusal of access, since any disadvantage imposed by a dominant undertaking is liable to discourage potential customers from using the goods and services it offers.

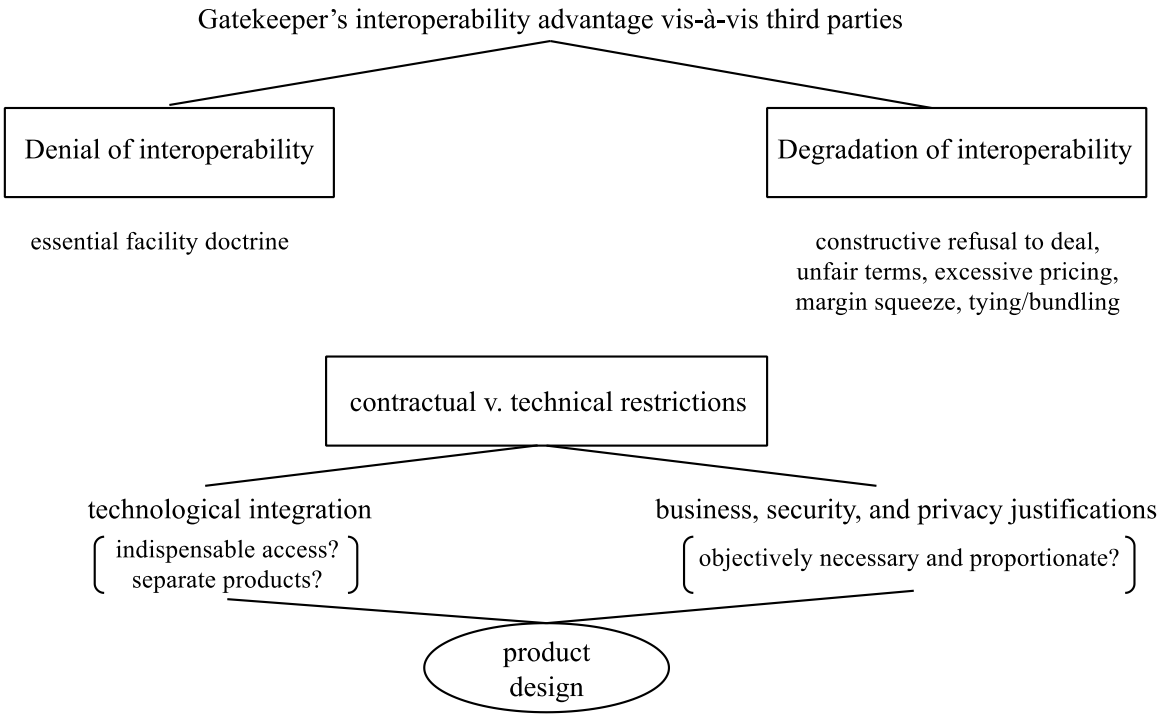
[15] European Commission, Case AT.40437, *Apple – App Store Practices (music streaming*).

[16] See General Court, Case T-201/04, *Microsoft Corp. v. Commission*, §§912–944, rejecting Microsoft's argument that media functionality formed an integral part of the operating system, since customers expect that any operating system will have the functionalities perceived as essential. On the US side, see *United States v. Microsoft Corp.*, 253 F.3d 34, 93 (D.C. Circuit 2001), stating that Microsoft's decision to combine the operating system and browser code into a single program was merely aimed at excluding rival browsers; and, previously, *United States v. Microsoft Corp.*, 147 F.3d 935 (D.C. Circuit 1998), stating that Microsoft's operating system constituted a single integrated product, which should be seen as a product that combines in a way that offers advantages unavailable if the functionalities are bought separately and combined by the purchaser.

[17] See, e.g., CJEU, 12 May 2022, Case C-377/20, *Servizio Elettrico Nazionale SpA v. Autorità Garante della Concorrenza e del Mercato*, EU:C:2022:379, §84; CJEU, 27 March 2012, Case C-209/10, *Post Danmark A/S v Konkurrencerådet* (*Post Danmark I*), EU:C:2012:172, §41.

[18] General Court, Case T-612/17, § 552.

Table 1
EU competition law and access restrictions to mobile ecosystems.



Antitrust law has traditionally approached with caution the examination of the internal mechanisms of enterprises, being reluctant to question business models and product designs to accommodate the needs of competitors (Ibáñez Colomo, 2021). Such interventions would, indeed, require antitrust enforcers to act as central planners, identifying the proper price, quantity, quality, degree of choice, and other terms of dealing. That is, they would be called to play a role usually belonging to regulators, beyond their practical ability to adequately supervise the undistorted functioning of competition within these markets. Nonetheless, because of the peculiar features of digital markets competition, antitrust authorities are increasingly prone to challenge firms' decisions on product design aimed at favoring their own products/services by impeding the compatibility with rival ones.[19] However, in these cases, mandating interoperability brings an additional layer of complexity as it involves the definition of technical features and requirements to ensure adequate levels of compatibility.

3.1. Competition law and product design: the Android Auto case

The legal and practical challenges that an antitrust enforcer may address by mandating interoperability are well illustrated by the Italian investigation in the *Android Auto* case,[20] recently decided by the Grand Chamber of the CJEU.[21]

Google refused to integrate Enel's X Recharge app (JuicePass) into Android Auto, an infotainment system that integrates on a car dashboard some features of Android devices, such as navigation, calls, maps, music, and text messages. By enabling a wide range of services for recharging electric cars (in particular, allowing drivers to locate a charging station, manage the charging session, and reserve a slot at the station), JuicePass is a rival of Google Maps app, which enables similar functionalities but does not include reservation and payment services.

[19] See, e.g., Autorité de la concurrence, 7 June 2021, Decision 21-D-11, *Google,* https://www.autoritedelaconcurrence.fr/en/decision/regarding-practices-implemented-online-advertising-sector, §410, stating that the limitation on interoperability with third-party services servers cannot be considered competition on the merits; and European Commission (2024d), investigating competition concerns over access restrictions to the NFC, i.e., the technology used for contactless payments with mobile devices in stores.

[20] Italian Competition Authority, 27 April 2021, Decision No. 29645, *Google/Enel X*. For an economic analysis of the case, see Motta and Peitz (2024). The Italian case differs from the ongoing German investigation into Google's practices related to Google Automotive Services (GAS) and Google Maps Platform (Bundeskartellamt, 2023). The German competition authority is concerned that Google offers GAS —which comprises Google Maps, Google Play Store, and Google Assistant— exclusively as a package to vehicle manufacturers. According to the Bundeskartellamt, this bundling could harm competition, potentially allowing Google to extend its dominance into other competitive markets. Further concerns arise from Google's agreements with certain manufacturers, which include sharing advertising revenue from Google Assistant, provided it is the only voice assistant installed. Additionally, Google's contractual obligations requiring GAS license holders to prioritize its services may limit market access. Finally, the authority is also investigating whether Google restricts or refuses interoperability with third-party services, particularly prohibiting the combination of Google Maps with other mapping services on the GAS platform.

[21] CJEU, Case C-233/23, *Alphabet et al. v. Autorità Garante della Concorrenza e del Mercato*.

Google refused to accommodate Enel's request to make JuicePass compatible with Android Auto, arguing that only media and messaging applications were permitted as third-party apps compatible with Android Auto. Additionally, Google stated that publishing JuicePass on Android Auto was not feasible due to security concerns and the necessity to efficiently allocate resources for the requested development.

However, according to the Italian Competition Authority (ICA), by obstructing and delaying the availability of Enel X's app on Android Auto, Google was attempting to favor its own app, ultimately reserving the full spectrum of recharging services to Google Maps. The ICA's reasoning is based upon the fact that Android Auto forms a "competitive space" within which service apps compete against the additional functionalities effectively or potentially offered by Google's proprietary navigation app. As a result, Google's conduct was deemed to amount to a refusal to allow interoperability, which led to a breach of the level playing field principle, consisting in the app owned by Google having an unfair advantage over the app owned by its competitor Enel X. Accordingly, the ICA considered that Android Auto is indispensable for the purposes of applying the essential facility doctrine. This is despite the fact that drivers with a smartphone can access JuicePass through both Google Play and the App Store.

The ICA apparently addressed the indispensability requirement with reference to Android Auto by departing from the definition provided by the CJEU in *Bronner*. Indeed, according to the decision, the indispensability element of the test is fulfilled as there are no alternatives that are as convenient and safe as Android Auto, despite the existence of less advantageous options for achieving the same result. In the ICA's view, safeguarding competition in digital markets necessitates consideration of their unique characteristics and dynamics. This includes recognizing that, on vertically integrated digital platforms, a dominant position in upstream markets can be leveraged by operators to establish dominance in downstream and related or emerging markets. Therefore, to guarantee effective competition protection and enhance consumer choice, the legal criteria typically employed in such cases should be applied with flexibility.

Further, due to Google's gatekeeping position and the conflicts of interest generated by its dual role, the ICA mandated the company to ensure an effective level playing field for all service apps offering recharge services. Therefore, Google was required to develop and update a proper template to accommodate the needs of third-party recharge applications, thereby allowing their interoperability with Android Auto.

Because of the unusual circumstances of the case, the Italian higher administrative court (Council of State) filed a request for a preliminary ruling seeking an interpretation from the CJEU regarding the obligations to which a dominant player in digital markets is subject.[22] Some of the questions the CJEU is expected to address are of utmost relevance as they involve the legal and practical obstacles an enforcer may face in mandating interoperability under competition rules.

Notably, one of the questions concerns the possibility of adapting the essential facility doctrine to the features of digital markets. To this end, the referring court asks whether, to meet the indispensability requirement in a refusal to supply case, it could be sufficient that access is indispensable "for a more convenient use" of the product or service offered by the undertaking requesting access, especially where the essential function of the product that is the subject of the refusal to supply is to make it easier and more convenient to use existing products or services.

Further questions pertain to the extent to which mandating interoperability could necessitate a redesign of the product. In particular, the referring court asks whether an abuse consisting in a refusal to grant access should be interpreted as meaning that: i) the fact that the product or service did not exist at the time of the request to supply must be taken into consideration as an objective justification for that refusal; ii) a competition authority is required to conduct an analysis of the time needed for a dominant undertaking to develop the product or service in respect of which access has been requested; iii) a dominant undertaking that has control over a digital platform may be required "to modify its own products, or to develop new ones", so that those who so request may access such products. On this last hypothesis, the referring court additionally asks the CJEU whether such a dominant undertaking is required to consider "the general requirements of the market or the requirements of a single undertaking" requesting access to the allegedly indispensable input.

The opinion delivered by the Advocate General (AG) Medina supported the ICA's findings, but reformulated the question raised by the Italian Council of State.[23] Indeed, as acknowledged by the same Medina, the question was about the interpretation of the indispensability requirement under *Bronner*, namely, whether the specific features of the functioning of digital markets justify departing from *Bronner* or, at least, interpreting it in a flexible manner.[24] By contrast, the AG replied focusing on the applicability of *Bronner* to the case at stake. In doing so, the AG argued that the *Bronner* conditions does not apply in so far as a dominant undertaking puts at the disposal of third-party operators a platform which is conceived and designed to be nourished by apps developed by those operators. Indeed, according to Medina, the *Bronner* framework is intended to apply only when the infrastructure in question has been developed for the dominant undertaking's own needs and reserved exclusively for its use.[25] In contrast, digital platforms like Android Auto are conceived not only to allow but to encourage third-party developers to create versions of their own apps that are compatible with it.

The Grand Chamber of the CJEU endorsed AG Medina's line of reasoning and confirmed the case law trend of limiting the application of the *Bronner*'s indispensability requirement to the specific circumstances of that case—namely, when there is an outright refusal to deal and the dominant company has developed an infrastructure for its own business needs and reserved it for exclusive use.[26] By contrast, this is not the case when the infrastructure has been developed "with a view to enabling third-party undertakings to use it," as in such a situation, requiring the company to provide access to third parties "does not fundamentally alter the economic model that applied to the development of that infrastructure."[27]

As a result, a dominant platform is obligated to develop a template to ensure interoperability with third-party apps.[28] The absence of a template for the specific category of apps or the development challenges the dominant undertaking may face cannot, by itself, serve as an objective justification for refusing to grant access. Nonetheless, antitrust enforcers are tasked with handling difficult challenges. Indeed, the CJEU indicated that objective justifications for a refusal include situations where granting interoperability through such a template would compromise the platform's integrity or security, or where technical reasons make it

[22] Consiglio di Stato, 7 April 2023, No. 3584, *Alphabet et al. v. Autorità Garante della Concorrenza e del Mercato*.

[23] Opinion of Advocate General Medina, 5 September 2024, Case C-233/23, EU:C:2024:694.

[24] Ibid., §17.

[25] Ibid., §§34–38. See, in a similar vein, CJEU, 10 September 2024, Case C-48/22 P, *Alphabet v. Commission (Google Shopping)*, EU:C:2024:726, §90; CJEU, 12 January 2023, Case C-42/21 P, *Lietuvos geležinkeliai AB v. Commission*, EU:C:2023:12, §80; CJEU, 25 March 2021, Case C-152/19 P, *Deutsche Telekom v. Commission*, EU:C:2021:238, §45. However, this does not seem to be the case of Bronner as it complained that Mediaprint has discriminated against it by including another daily newspaper (Wirtschaftsblatt) in its home-delivery scheme (CJEU, Case C-7/97, §8).

[26] CJEU, Case C-233/23, §§39-42.

[27] Ibid., §§44-46.

[28] Ibid., §§73-74.

impossible to achieve interoperability by developing such a template.[29]

Further, considering all relevant circumstances, the need for "a reasonable period to develop the template" may also be deemed objectively necessary and proportionate.[30] This assessment should account for both the needs of the undertaking requesting access to the dominant platform and the challenges faced by the dominant undertaking in developing the template.[31] Moreover, since developing a template is likely to entail costs for the dominant platform, the platform is entitled to request an "appropriate financial contribution" that must be "fair and proportionate."[32] In this regard, it is the responsibility of the competent competition authority (considering all relevant circumstances and the reasons provided by the dominant platform to justify its refusal to develop a template enabling interoperability for a third-party app) to determine whether the refusal was objectively necessary and assess its proportionality.[33]

4. Vertical interoperability under the DMA

In the aftermath of the CJEU's Grand Chamber decision, it is apparent that, from a theoretical perspective, competition law is sufficiently flexible to serve as a tool for requiring a dominant platform to ensure interoperability with third parties. Paradoxically, *Android Auto* creates even more room for mandating interoperability than the DMA. Under competition law, the obligation to grant access is broader, as it applies to all dominant platforms (rather than only designated gatekeepers) and covers all services (rather than just designated core platform services). Nonetheless, the technical questions that antitrust enforcers are required to address the difficulties in tackling the issue of crafting feasible and effective solutions mandating interoperability under competition law. Indeed, difficulties arise not only in designing an interoperability remedy but also in monitoring its implementation. In this regard, regulatory interventions appear better suited for such a task. For these reasons, the DMA comes with lofty expectations. Inspired by antitrust investigations, the DMA introduces two vertical interoperability obligations relevant to our analysis of mobile ecosystems (Bourreau, 2022).

In particular, pursuant to Article 6(4), gatekeepers must allow the sideloading of applications and app stores on their ecosystems. The gatekeeper shall allow and technically enable the installation and effective use of third-party software applications or software application stores using, or interoperating with, its operating system and allow those software applications or software application stores to be accessed by means other than the relevant core platform services (CPSs) of that gatekeeper. Nonetheless, in order to ensure that third-party software applications or software application stores do not endanger the integrity of the hardware or operating system provided by the gatekeeper as well as end users' security, it should be possible for the gatekeeper concerned to implement strictly necessary and proportionate measures and settings, other than default settings, to achieve that goal, provided that these measures are duly justified by the gatekeeper.[34]

Furthermore, Article 6(7) deals with access (and its terms) to essential hardware or software functionalities of the operating system are used by the gatekeeper for its own products or services. Notably, the gatekeeper is required to allow providers of services and providers of hardware, free of charge, effective interoperability with, and access for the purposes of interoperability to, the same hardware and software features accessed or controlled via the operating system or virtual assistant as are available to services or hardware provided by the gatekeeper. Also in this case, the gatekeeper is not be prevented from taking strictly necessary and proportionate measures to ensure that interoperability does not compromise the integrity of the operating system, virtual assistant, hardware or software features provided by the gatekeeper. Gatekeeper's capacity to adopt these measures is, however, limited to its provision of an adequate justification of their necessity and proportionality.

The DMA acknowledges vertical interoperability can level the playing field for internet access services as the gatekeepers' control over hardware and operating systems may technically limit the ability of end users to effectively switch between different providers.[35] The Regulation explicitly refers to wearable devices to argue that competing providers require equally effective interoperability with, and access for the purposes of interoperability to, the same hardware or software features to be able to directly provide a competitive offering to end users.[36] Further, gatekeepers may also play a dual role and, therefore, may be incentivized to prevent alternative service and hardware providers from having access under equal conditions to the same operating system, hardware or software features available or used by the gatekeeper in the provision of its own complementary or supporting services or hardware. Therefore, the aim of the obligations under Article 6(7) is to allow competing third parties to interconnect through interfaces or similar solutions to the respective features as effectively as the gatekeeper's own services or hardware.[37]

Finally, to ensure that these obligations are applied effectively and are not circumvented, gatekeepers are not allowed to engage in any behavior undermining interoperability, such as by using unjustified technical protection measures, discriminatory terms of service, unlawfully claiming a copyright on APIs or providing misleading information.[38]

Against this background, the next Section analyses the technical solutions set forth by Apple for Articles 6(4) and 6(7) which, in principle, are directed at attaining effective compliance with the DMA. In doing so, relying on iOS, the Section enquires whether the new regulation will live up to the expectations it has prompted by delivering effective, smooth, and seamless vertical interoperability into mobile ecosystems.

4.1. *Compliance with the general obligation of vertical interoperability under Article 6(7) DMA*

Apple asserts that, prior to the DMA, it had already facilitated enhanced vertical interoperability functionality through its software development kits and APIs, granting developers access to core technologies embedded within iOS and iPhone devices (Apple, 2024a). In accordance with the gatekeeper's compliance report, Apple now supports 40 different software developer kits and developer services, along with granting access to over 250,000 APIs, offering interoperability solutions across its services. Despite this, stakeholders have expressed concerns due to Apple's lack of transparency in disclosing which APIs enable access to specific data or functionality. In any case, the gatekeeper acknowledges the necessity of accommodating new forms of

[29] Ibid., §73.
[30] Ibid., §74.
[31] Ibid., §§74-75. The CJEU highlighted the following factors as particularly relevant: (i) the degree of technical difficulty involved in developing the template for the specific category of apps; (ii) limitations arising from the inability to rapidly acquire certain resources, particularly human resources, needed to develop the template in line with the requesting undertaking's needs; and (iii) external constraints affecting the dominant undertaking's ability to develop the template, such as those stemming from the applicable regulatory framework.
[32] Ibid., §76.
[33] Ibid., §80.
[34] Digital Markets Act, Recital 50.
[35] Ibid., Recital 54.
[36] Ibid., Recital 55.
[37] Ibid., Recital 57. See also Recital 56, referring to functionalities such as NFC technology, secure elements and processors, authentication mechanisms, and the software used to operate those technologies.
[38] Ibid., Recital 70.

access by engineering new APIs in future updates to Apple's operating system.

Aside from the aforementioned general statement, Apple has made concessions in its compliance report by granting access to several APIs to support contactless payments for wallet and banking apps. The technical implementation falls outside the scope of the DMA's obligations but instead is an immediate consequence of the commitments made by Apple to the EC concerning sanctioning proceedings related to its potential abuse of dominance in mobile wallet markets on iOS devices. This abuse involved restricting access to NFC technology used for contactless payments in stores with mobile devices (European Commission, 2024d). However, these changes have yet to materialize on either front.

Furthermore, Apple has devised a *de facto* solution to comply with the terms of Article 6(7) DMA by introducing a new dedicated process for developers to request enhanced interoperability with iPhone and iOS hardware and software. Stemming from the DMA's shift in the burden of intervention against gatekeepers, Apple proposes a new process to assess interoperability requests at the gatekeeper level. Business users are required to directly request the interoperability solution, which Apple then evaluates on a case-by-case basis to determine if it falls within the scope of Article 6(7). Following this initial assessment, Apple decides whether to proceed with devising the solution and whether it can be integrated into the operating system. Thus, Apple retains the discretion to deny interoperability requests.

Upon acceptance of the interoperability request, Apple will present a tentative project plan to the developer. However, this second stage of the dedicated process will not proceed immediately. Similar to the initial process, Apple evaluates whether the development of the interoperability solution is technically feasible. At this point, Apple may reject the request if it is technically impossible. The gatekeeper commits to providing updates on the request's status every 90 days and will notify the developer only once the interoperability implementation is completed, either through a pre-release or software update and by releasing the relevant technical documentation detailing how business users can implement each solution. Following the release of the technical implementation, it remains unclear whether all business users can adopt the solutions engineered by Apple on a case-by-case basis. In essence, the gatekeeper may establish certain criteria for granting access to the interoperability solutions, depending on the type of implementation.

One could argue that Apple's technical implementation falls within the range of the compliance solutions available to gatekeepers under Article 6(7). However, a closer look at the compliance reports of gatekeepers with designated operating systems as CPSs under the DMA suggests a different scenario. Indeed, neither Alphabet nor Microsoft has introduced similar dedicated processes to address vertical interoperability solutions. Both gatekeepers maintain that their operating systems already fulfill the requirements outlined in Article 6(7). For example, Google Android encompasses the AOSP source code developed by Google for smart mobile devices, given its open-source nature, making it accessible to both first-party and third-party products (Alphabet, 2024). Consequently, third-party app and hardware developers can access and interact with Google Android in the same manner as Google's first-party apps and hardware. Microsoft asserts that most of its functionality is already interoperable with third-party applications, but it has recently introduced new extensibles in areas related to APIs, which can now be accessed by third-party applications as a result of the DMA's implementation (Microsoft, 2024).

Overall, Apple's compliance solution largely falls short of meeting the legal requirements for ensuring free-of-charge and effective interoperability with its hardware and software features. While the provision doesn't mandate absolute equality, it requires equivalence in terms of functionality available to third parties (Bourreau, 2022). Essentially, Apple isn't directly compelled to provide access to the same APIs it uses, but rather to offer APIs and functionality that provide a comparable service to third parties. Therefore, if Apple were to engineer its products using a similar dedicated process for vertical interoperability and API access as outlined in its compliance solution, the intervention threshold set by the equivalence of input wouldn't hinder the gatekeeper from providing such a compliance solution to third parties. However, it's crucial that the equivalence of input, as specified by Article 6(7), be optimized to the standard of effectiveness. In simpler terms, business users must genuinely benefit from vertical interoperability.

In essence, the legal standard outlined in Article 6(7) resembles the second strand of antitrust theories of harm concerning the deterioration of interoperability conditions compared to the superior functionality enjoyed by the dominant undertaking. However, Article 6(7) differs from competition law in that it applies *per se* and doesn't necessitate demonstrating significant harm to competition. In other words, a violation of Article 6(7) can be established simply by showing, for instance, the gatekeeper's failure to comply with the effectiveness requirement.

In this context, Apple's proposed compliance strategy under the DMA appears to reinforce its reluctance to open its closed ecosystem to vertical interoperability. At the very least, the compliance solution introduces a dedicated approach for business users to pursue interoperability. Consequently, these efforts could potentially result in business users gaining access to APIs or even compel Apple to modify some of its hardware and software features to meet the intervention threshold required by Article 6(7). It could be argued that Apple should have proactively identified the gaps in its provision of the standard of vertical interoperability required by the DMA and opened dedicated processes to address instances where it acknowledges the right to vertical interoperability exists.

4.2. *Compliance with the obligation of vertical interoperability at the app store-level under Article 6(4) DMA*

Before the DMA came into effect, app distribution options within Apple's closed ecosystem were extremely limited. Essentially, the only feasible method to download apps on iOS was through Apple's proprietary App Store (Costello, 2024). With the introduction of Article 6(4) DMA, the gatekeeper is compelled to undergo its most significant transformation yet. In line with the principle of vertical interoperability, app distribution must now occur through channels not directly controlled by Apple.

This transformation of Apple's digital ecosystem encompasses both upstream and downstream app distribution on iOS. Therefore, Article 6 (4) facilitates the emergence of alternative app stores competing with the App Store (upstream competition)[39] and allows for apps to be downloaded through various other means (downstream). These alternative distribution channels include downloading apps directly from the web (sideloading) or through other alternative distribution channels facilitated by the provision.

Apple's adaptation of its business model due to the implementation of the provision at issue encompasses a comprehensive shift in how the gatekeeper appropriates its investments in its operating systems. One of the most notable aspects of Apple's compliance strategy, however, is its associated enforcement approach. Unlike other gatekeepers, Apple only briefly outlines the technical implementation proposed for the provision, despite its far-reaching impact on its business model (Apple, 2024a).[40] In fact, Apple unveiled its compliance solution two months ahead of the 7th of March 2024 deadline, detailing how the transformation would unfold in practice (Apple, 2024b). While the terms of the technical implementation remained largely unchanged from January to March, Apple made adjustments to the compliance solution

[39] See, e.g., Epic Games recently announcing the launch of a rival app store for iOS (Wired, 2024).

[40] The very same approach was more recently extended by Apple (2024 f) to iPadOS.

by refining it in the days and months following the compliance deadline.[41]

In practical terms, Apple has upended its closed digital ecosystem regarding app distribution. This change allows alternative app marketplaces to distribute apps on iOS, and third-party developers can now reach end users through methods other than the App Store. However, this transformation comes with conditions. Indeed, the gatekeeper has not relinquished its control over app distribution entirely.

Notably, the availability of a third-party app store is contingent upon meeting the requirements of the Alternative App Marketplace Entitlement, which is granted by Apple if the provider fulfills certain criteria. These include being enrolled in the Apple Developer Program as an organization incorporated, domiciled, or registered in the EU; providing and maintaining a stand-by letter of credit worth EUR 1000,000 from a financial institution with at least an A rating; or being a member in good standing in the Apple Developer Program for two continuous years or more, with an app that had over one million first-time installs on iOS in the EU in the previous calendar year.

Further, Apple allows developers to distribute third-party apps through their own developer accounts via their own websites or those they manage, provided they meet certain conditions. In addition to the specific criteria for third-party app stores to be authorized to distribute applications on iOS, developers must have been in good standing with the Apple Developer Program for at least two years and have had at least one third-party iOS app in their account with over one million first-time installs in the EU in the past calendar year.

Therefore, while it no longer mandates that alternative distributors agree to the stringent terms imposed on developers for App Store access, Apple still holds them accountable to comply with its rules as the primary arbiter of its digital ecosystem. In particular, to ensure compliance, Apple has introduced a new authorization process, known as the notarization process, which serves as a baseline review for all apps and consists of a combination of automated checks and manual human review of the accuracy, functionality, safety, security, and privacy, of the reviewed app. Any app or alternative app marketplace must obtain Apple's approval through notarization to be available on iOS.

Moreover, Apple requires a multi-step process for end users to install third-party app stores from the provider's website, including approving the installation in the iPhone's Settings. Similarly, to install third-party iOS apps directly from a developer's registered website, users must approve the developer in their iPhone's Settings. In both cases, before installing the third-party apps, a new system sheet will display information submitted by developers to Apple for review, such as the app's name, the developer's name, a description, screenshots, and the system's age rating.

Finally, Apple's New Business Terms introduce a new fee structure, including a Core Technology Fee (CTF) of EUR 0.50.[42] For third-party app stores, this fee applies to each first annual install of their app store. For developers of third-party apps, the CTF is charged on first annual installs exceeding one million, regardless of whether the apps are distributed through the App Store or alternative channels. The CTF does not apply to small developers (with less than EUR 10 million in global annual revenue) and other specified categories of developers.

4.3. Summary of findings and recent updates

Against this background, the EC has recently initiated a non-compliance procedure over concerns that the vertical interoperability model introduced by Apple falls short of ensuring effective compliance with obligations under the DMA (European Commission, 2024e and 2024f).

Notably, Commission's doubts regard the necessity and proportionality of the contractual requirements for third-party app developers and app stores (European Commission, 2024f, §§16–20). The investigation will, in particular, involve: a) the Apple's Core Technology Fee, under which developers of third-party app stores and third-party apps are required to pay a €0.50 fee per installed app; b) the multi-step journey that a user has to undertake to successfully complete the download and installation of alternative app stores or apps, as well as the various information screens displayed by Apple to the user; c) the eligibility requirements for developers related to the ability to offer alternative app stores or directly distribute apps from the web on iPhones.

More specifically, the EC expressed concerns about whether both Apple's Original Business Terms and New Business Terms comply with the requirements under Article 6(4) DMA to allow effective use of alternative distribution channels by business users and end users. The investigation will also assess whether the fee structure in the New Business Terms, particularly the CTF, complies with Article 6(4) and whether this fee structure unduly restricts the use of alternative distribution channels, thereby undermining effective compliance with Article 6(4).

Additionally, the EC will examine whether the requirements of the Alternative App Marketplace Entitlement, imposed by Apple on third-party app stores and developers seeking access to web distribution, undermine effective compliance with Article 6(4) and whether these requirements are strictly necessary and proportionate.

Furthermore, the investigation will determine whether the steps and screens displayed for users to install third-party app stores or authorize developers to offer apps for direct download from the web undermine effective compliance with Article 6(4). It will also assess whether Apple has adequately justified these measures as strictly necessary and proportionate.

Finally, it is worth noting that the EC also expressed doubts about whether Apple's CTF, insofar as it could be considered a condition for granting access to certain software features necessary for third-party apps and app stores on iOS, complies with the obligation under Article 6(7). Indeed, this obligation requires that providers of services have effective interoperability with hardware and software features accessed or controlled via the operating system, as are available to services or hardware provided by the gatekeeper, "free of charge."

In any case, the decision clarified that it does not preclude the possibility for the Commission to open proceedings regarding, among other things, Apple's notarization system and the conditions for distributing third-party apps through alternative channels, including the processes for their installation and updates (European Commission, 2024f, §23).

By and large, the analysis of Apple's compliance with the DMA's provisions on vertical interoperability —specifically, the technical solutions proposed by Apple and their evaluation by the European Commission— raises relevant questions about the new regulation's capability to ensure effective enforcement.[43]

With the shift to the regulatory approach, the burden of intervention

[41] For instance, Apple (2024c, 2024d, 2024e) updated its compliance report on 12 March and 2 May 2024 opening up the possibility of sideloading without requiring the presence of an alternative marketplace.

[42] With specific regard to the access fees for alternatives to the Apple App Store, see Scott Morton et al. (2024), arguing that, while the DMA permits Apple to charge a fixed fee to review the security of third-party app stores or apps distributed through and operated on Apple's operating system (Review fee), the fees Apple places on third-party app stores for the right to reside on iOS (Access fee) should be constrained to zero under the DMA in order to promote contestability.

[43] See also Perez (2024) reporting that Spotify claims Apple has discontinued the technology that allows Spotify users to control the volume on their connected devices. Notably, while users could previously adjust the volume using the physical buttons on the side of their iPhone when streaming to connected devices via Spotify Connect on iOS, they will now need to use the volume slider in the Spotify Connect menu within the app to control the volume on connected devices.

and proof no longer lies with the antitrust enforcer; instead, target undertakings must demonstrate how they integrate compliance solutions into their business models in line with the DMA's objectives of contestability and fairness. However, although one might expect the DMA's obligations to be easy to apply and enforce in practice, this does not seem necessarily to be the case. This is particularly apparent when compliance involves strategic decisions about the design of technical features that may either address genuine security and privacy concerns or be opportunistically exploited to undermine potential competition, making it extremely difficult for an enforcer to disentangle these different hypotheses. As a consequence, the opening of several non-compliance proceedings by the Commission suggests that litigation may be a common method of engagement under the DMA, thus replicating traditional antitrust enforcement dynamics.

In this context, under the DMA, the Commission may initiate different types of procedures (ranging from engagement with gatekeepers via a regulatory dialogue to punitive interventions) to compel gatekeepers to meet the threshold of effective enforcement. In this context, EC has underscored the critical role of interoperability by initiating two specification proceedings to assist Apple in complying with its interoperability obligations under Article 6(7) DMA (European Commission, 2024g). Notably, the first proceeding focuses on iOS connectivity features and functionalities, while the second addresses the process Apple has established for handling interoperability requests from developers and third parties.

As acknowledged by the Commission (2024 g, §§18–19), Article 6(7) DMA does not require gatekeepers to introduce a request-based process, nor does it require the publication of a reference offer. Hence, as part of its compliance with Article 6(7), it is for the gatekeeper to ensure that hardware or software features which are accessed or controlled via a designated operating system are available to third parties as effectively as they are available to the gatekeeper's own services or hardware. The Commission (2024 g, §19) considers such a proactive approach to compliance and interoperability "particularly important with respect to new features." Indeed, "[u]nlike proactive approaches such as interoperability by design, a request based system (also referred to as a "ticketing system") may present important limitations and difficulties for third parties" (European Commission, 2024g, §20). In particular, it may cause delays in the processing of requests and the implementation of solutions and it leads to associated transaction costs; it may also necessitate the disclosure of third parties' confidential information to the gatekeeper; moreover, "it enables the gatekeeper to maintain control over the request process and its outcome (i.e. whether, when and how interoperability will be provided)" (European Commission, 2024g, §20). Nonetheless, since it might be challenging in practice for the gatekeeper to immediately ensure effective interoperability with all existing features for which interoperability was not foreseen by design, the Commission considers it appropriate to specify certain relevant aspects of Apple's process for handling requests for interoperability to ensure effective compliance with Article 6(7).

These specification proceedings mark the first instances of regulatory dialogues triggered under Article 8(2) DMA, which allows the EC to specify measures a gatekeeper must take to ensure compliance with the DMA's substantive obligations. It is notable that the EC chose to explore this approach specifically in relation to the general obligation of vertical interoperability.

The recent final decisions adopted by the Commission, outlining the measures Apple must take to comply with specific aspects of its interoperability obligation, reaffirm its stance (European Commission, 2025a). Notably, the Commission defined two sets of measures. The first set concerns iOS connectivity features, primarily used for connected devices such as smartwatches, headphones, or TVs. It aims to grant device manufacturers and app developers improved access to iPhone features that interact with such devices, enabling faster data transfers and easier device setup (European Commission, 2025b). The second set addresses the process Apple established for developers seeking interoperability with iPhone and iPad features. It seeks to enhance the transparency and effectiveness of this process by ensuring access to technical documentation for features not yet available to third parties, facilitating timely communication and updates, and providing a more predictable timeline for reviewing interoperability requests. (European Commission, 2025c)

5. Concluding remarks. Much ado about nothing?

The DMA has been adopted to address an alleged antitrust enforcement failure (Cappai and Colangelo, 2021). As argued by Commissioner Vestager (2024), it was born out of a reflection process "very much influenced by our antitrust enforcement experience where we have seen the temptation to flout the law." Indeed, the DMA's obligations are essentially inspired by several antitrust investigations brought by the EC in the tech sector, which include two cases against Apple (the AppStore and Apple Pay cases). EU competition law is criticized for its lack of effectiveness in addressing anticompetitive behavior by digital gatekeepers.[44] This perceived failure stems from slow-paced antitrust proceedings, the complexity of establishing theories of harm related to new forms of digital conduct, and the resultant delay in enforcement actions. According to this perspective, prolonged litigation undermined the original goal of restoring competitive market conditions and, even when enforcement actions succeed, the remedies often fell short of fully rectifying the distortions in the competitive process.

In this regard, in general terms, the rationale of the *ex ante* regulation appears questionable. While the regulatory intervention was touted as self-executing to avoid prolonged litigation tied to competition law enforcement, the initiation of non-compliance investigations suggests that legal disputes may become frequent. Further, traditional competition law provides a flexible framework for scrutinizing several practices described as new and peculiar to digital markets, including app stores (Borgogno and Colangelo, 2022).

However, this does not apply to interventions aimed at solving structural market deficiencies and implementing industrial policy objectives, which is the case of promoting interoperability in mobile ecosystems. As previously illustrated, mandating interoperability to ensure a level playing field and impose a public utilities-like neutrality regime is usually outside the scope of competition rules. Moreover, even when the EFD is actionable, significant doubts emerge about the possibility for antitrust authorities to craft feasible and effective remedies involving product design. In summary, in such a specific scenario, regulation appears better suited. Indeed, as opposed to antitrust, the DMA compels dominant undertakings to transform their business models at their core and not eliminate specific conduct distorting competition. It's evident that the efforts outlined in Articles 6(4) and 6(7) DMA to open mobile ecosystems wouldn't have been accomplished solely through competition law.

Nonetheless, the compliance strategy deployed by Apple demonstrates that companies may still hesitate to fully embrace the changes mandated by the new regulation. They might resort to technicalities to bypass the essence of the provisions, create frictions to make alternative products and services unattractive or not fully viable, and retain complete control over their ecosystems, thereby undermining the very *raison d'être* of the DMA (Franck and Peitz, 2024).

Against this background, it is the EC's task to operationalize the DMA's anti-circumvention rules,[45] thus ensuring that the DMA lives up to expectations. If effective remedies are not delivered, it would signify a failure of the entire regulatory intervention. This would raise further questions about its justification, as it would demonstrate an inability to bring any added value compared to competition law enforcement. The decisions recently adopted by the Commission to assist Apple in

[44] Digital Markets Act, Recital 5.
[45] Ibid., Recital 70 and Article 13.

complying with its interoperability obligations under Article 6(7) DMA confirm that the EC is fully aware of the stakes involved.

Author statement

The authors have contributed equally to this work.

Data availability

No data was used for the research described in the article.

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