

**Interoperability in Digital Markets: Extending the regulatory and technical framework
from the financial sector**

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Introduction

Digital markets are dominated by large firms such as Google, Meta, Amazon and Apple (hereinafter referred to as “big tech”). Regulations across various jurisdictions, such as the Digital Markets Act (DMA)¹ and the Data Act (DA)² in the EU or the proposed ACCESS Act in the US³, formulate several interoperability obligations on these firms to interconnect some of their services with other players to facilitate their entry and expansion. However, emerging regulatory frameworks leave the question of implementing interoperability mandates entirely open. One explanatory hypothesis for the absence of prescriptions is that the issue raises many trade-offs that other institutions might be better placed to address than lawmakers. Some of these trade-offs arise from the sharing of data between firms, which may result in breaches of data security or privacy violations,⁴ encouraging free-riding⁵ and mandatory sharing of IPR-protected technical infrastructure with other players or the standardisation of the technical infrastructure which may result in reduced innovation and differentiation leading to fewer functionality for the end-users.⁶

Due to the difficulty in ascertaining the trade-offs and the information asymmetry regarding the digital platforms between the regulator and the regulated entities, ex-ante regulations defer to the big tech firms to comply with the obligations. However, the paper argues that the compliance model is insufficient for effectively implementing interoperability obligations. The paper suggests that to meaningfully achieve the objectives set by the ex-ante regulations, such as the DMA, a more active role of the regulator is required to oversee the implementation. Considering this, the project investigates whether an interoperability model derived from the financial sector might provide a suitable blueprint for interoperability in digital services.

There are two reasons for this. First, interoperability models that manage trade-offs well have been deployed in several jurisdictions. To some extent, this can be attributed to well-designed regulation and an active regulator overseeing the implementation of such regulation. For

¹ Regulation (EU) 2022/1925 of the European Parliament and of the Council on contestable and fair markets in the digital sector (DMA), September 14, 2022. Articles 6(4), 6(7) and 7 of the DMA impose interoperability on the gatekeepers providing certain core platform services (CPS).¹ While Articles 6(4) and 6(7) mandate vertical interoperability between operating systems (OS) and third-party software applications or rival application stores, Article 7 provides for horizontal interoperability among gatekeepers providing number-independent interpersonal communications (NIICS) services such as WhatsApp.

² Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act).

³ H.R.3849 - 117th Congress (2021-2022), <http://www.congress.gov/>.

⁴ Laura Alexander and Randy Stutz, ‘Interoperability in Antitrust Law & Competition Policy’, (2021) CPI Antitrust Chronicle, <https://www.competitionpolicyinternational.com/wp-content/uploads/2021/06/4-Interoperability-in-Antitrust-Law-Competition-Policy-By-Laura-Alexander-Randy-Stutz.pdf>; Christopher Yoo, ‘Unpacking Data Portability’, (2020) CPI Antitrust Chronicle, <https://www.competitionpolicyinternational.com/wp-content/uploads/2020/11/5-Unpacking-Data-Portability-By-Christopher-S.-Yoo.pdf>; Bennett Cyphers and Cory Doctorow, ‘Privacy Without Monopoly: Data Protection and Interoperability’, Electronic Frontier Foundation, 12 February 2021, <https://www.eff.org/wp/interoperability-and-privacy>.

⁵ See Aurelien Portuese, ‘The Digital Markets Act: European Precautionary Antitrust’, 24 May 2021, <https://itif.org/publications/2021/05/24/digital-markets-act-european-precautionary-antitrust/>, accessed 5 February 2024.

⁶ Urs Gasser, ‘Interoperability in the Digital Ecosystem’ (2015) Berkman Klein Center for Internet and Society Research Publication No. 2015-13, <https://ssrn.com/abstract=2639210>, accessed 14 December 2023; Jay Ezrielev, Genaro Marquez, ‘Interoperability: The Wrong Prescription for Platform Competition’, CPI Antitrust Chronicle, 1 – 9.

example, in Brazil and India, the Central Bank provides licenses to entities based on compliance with different safeguards such as security and privacy. Second, the question of a horizontal extension of the financial sector experience with interoperability to digital markets also makes sense. Certain market features of digital services resemble financial markets, such as data-intensiveness, network effects, economies of scope and asymmetric information, which lead to the entrenching of market power of incumbents.

Literature review

It is an established understanding that interoperability can be helpful in “winner take all” markets as it allows other rival services a chance to compete by lowering entry and expansion barriers.⁷ It is a remedy that can restore competition in markets where traditional antitrust remedies are inadequate.⁸ It has been a feature across various network industries, such as telecommunications.⁹ An obligation to provide interconnection ensures that the market does not tip in favour of just one provider.¹⁰ Although the idea of using open banking models for interoperability and data-sharing has been mentioned previously,¹¹ it has yet to be explored as a framework.

Research question(s)

The main research question that the thesis examines is: *To what extent can the policy paradigm adopted to deliver interoperability in other industries, such as in the financial sector, be replicated in digital markets?* To answer this question, the research will focus on the following sub-questions:

- i. What are the trade-offs with interoperability in digital markets and how should policymakers assess the impact of such trade-offs?
- ii. What are the different approaches through which interoperability is imposed across sectors?

⁷ Scott Morton, Gregory S. Crawford and others, ‘Equitable Interoperability: The ‘Super Tool’ of Digital Platform Governance’ (2021) Yale Tobin Center for Economic Policy, Digital Regulation Project, Policy Discussion Paper No. 4, <http://dx.doi.org/10.2139/ssrn.3923602>; Hovenkamp, Herbert J., ‘Antitrust Interoperability Remedies’ (2022) Faculty Scholarship at Penn Law, 2814, https://scholarship.law.upenn.edu/faculty_scholarship/2814, accessed 14 December 2023; Katz M L and Shapiro C, ‘Systems Competition and Network Effects’, (1994) The Journal of Economic Perspectives, Vol. 8, Issue 2, pp. 93-115.

⁸ Kades M and Scott Morton F M, ‘Interoperability as a competition remedy for digital networks’ (2020), Washington Center for Equitable Growth, <https://equitablegrowth.org/wp-content/uploads/2020/09/092320-WP-Interoperability-as-a-competition-remedy-for-digital-networks-Kades-and-Scott-Morton.pdf>.

⁹ Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications* (MIT Press, 2001).

¹⁰ Katz M L and Shapiro C, ‘Network Externalities, Competition and Compatibility’ (1985) The American Economic Review, Vol. 75, No. 3, pp. 424-440; Katz M L and Shapiro C, ‘Systems Competition and Network Effects’, (1994) The Journal of Economic Perspectives, Vol. 8, Issue 2, pp. 93-115.

¹¹ *Unlocking Digital Competition*, Report of the Digital Competition Expert Panel (March 2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf, accessed 10 December 2023, pg. 5; Oscar Borgogno & Giuseppe Colangelo, ‘Data Sharing and Interoperability Through APIs: Insights from European Regulatory Strategy’, (2018) Stanford-Vienna European Union Law Working Paper No. 38, <http://tlf.stanford.edu>, accessed 10 December 2023; Mikolaj Barcentewicz, ‘Minimizing Privacy Risks in Regulating Digital Platforms: Interoperability in the EU DMA’, July (2022) CPI Antitrust Chronicle; Mohit Kalawatia and Srijita Bose, ‘Interoperability affects platforms like WhatsApp, Signal, Telegram. EU can learn from India’, *The Print*, April 2022, <https://theprint.in/opinion/interoperability-affects-platforms-like-whatsapp-signal-telegram-eu-can-learn-from-india/905360/>, accessed 10 December 2023; Luigi Zingales, ‘Regulating Big Tech’, December 2022, BIS working paper no. 1063.

- iii. What should be the optimum level of regulatory intervention to implement and enforce interoperability in digital markets?
- iv. Which regulatory mechanisms used in the financial and other sectors have been identified as facilitating successful interoperability? Can such mechanisms be used to balance competition and innovation in the digital markets?

Originality and contribution

The importance of interoperability in maintaining competition and preventing market tipping in sectors characterised by network effects has long been recognised,¹² however, studies that analyse how interoperability can be operationalised and implemented through competition law and sector regulation remain scarce. The project aims to look at regulated interoperability frameworks to bridge the gap in the literature concerning the effective implementation of interoperability on digital platforms.

One of the frameworks that the project emphasises on is the interoperable payment systems in India, Unified Payment Interface (UPI) to understand how interoperability can be achieved with privacy and security built into the infrastructure by the regulator. The UPI works on a common layer (unified interface) of NPCI, which coordinates transactions and ensures settlement among bank accounts.¹³ Banks and third-party application providers connect to this interface through standard APIs to facilitate transactions from the user's virtual payment address in a masked manner without sharing account details or other information.¹⁴ The exchange is done over banking networks and the details are neither stored nor used for any other purpose.¹⁵ This ensures interoperability with minimal data exchange between rival services and maintains data security. It also ensures that there is competition among different services. For instance, the consumers using UPI have a choice among 70 different payment apps.¹⁶ While there are still winners and losers in the market, it is ensured that such competition occurs on merits such as good quality services, promotional strategies and user interface.

However, the project also acknowledges that there are fundamental differences between digital markets and the financial sector. Firstly, the financial sector, generally, already has an existing institutional framework used as a foundation to provide interoperability. Secondly, the information asymmetry between the regulator and the regulated entities in the digital markets is higher due to the complex nature and multiple functionalities of the digital platforms. Thirdly, the data generated in digital services could be massive in terms of its quantity and nature

¹² Chris Riley and James Vasile, 'Interoperability as a Lens onto Regulatory Paradigms', (2021) *CPI Antitrust Chronicle*, 52-58.; Mike Masnick, 'Protocols, Not Platforms: A Technological Approach to Free Speech', (2019) <https://knightcolumbia.org/content/protocols-not-platforms-a-technological-approach-to-free-speech> accessed 4 February 2024; Majority Staff of H. Comm. on Judiciary, Subcomm. on Antitrust, Commercial & Admin. Law, Rep. on Investigation of Competition in Digital Markets (Oct. 4, 2020), https://judiciary.house.gov/uploadedfiles/competition_in_digital_markets.pdf accessed 4 January 2024; Competition & Markets Authority, *Online Platforms and Digital Advertising—Market Study* Final Report (July 2020), [https://assets.publishing.service.gov.uk/media/5fa557668fa8f5788db46efc/Final_report_Digital_A LT TEXT.pdf](https://assets.publishing.service.gov.uk/media/5fa557668fa8f5788db46efc/Final_report_Digital_A_LT_TEXT.pdf) ("CMA Report"); Stigler Committee on Digital Platforms, Final Report (September 2019), <https://www.chicagobooth.edu/-/media/research/stigler/pdfs/digital-platforms---committee-report---stigler-center.pdf>, accessed 4 February 2024.

¹³ Gochhwal, R. 'Unified Payment Interface—An Advancement in Payment Systems' (2017) *American Journal of Industrial and Business Management*, 7, 1174-1191. <https://doi.org/10.4236/ajibm.2017.710084>.

¹⁴ UPI FAQs, <https://www.npci.org.in/what-we-do/upi/faqs>.

¹⁵ *Ibid*.

¹⁶ UPI Ecosystem Statistics, December 2023, <https://www.npci.org.in/what-we-do/upi/upi-ecosystem-statistics>, accessed 3 February 2024.

compared to the data in the financial sector. This might make it difficult for digital services to be as technically efficient once interoperability is implemented through a regulator. Keeping these limitations in mind, the project attempts to develop criteria to characterise an effective interoperability framework by engaging in the interdisciplinary study between law and technology.

An effective interoperability framework could benefit rival businesses currently dependent on the dominant entities to provide services to consumers. Such a model could enhance innovation by incentivising competition on merits. It will also provide consumers with more choices between different platforms. For instance, for a consumer who does not want to use WhatsApp, the proposed model would allow such a consumer to be on another app while connecting with other users on WhatsApp (horizontal interoperability). Similarly, such a framework could address access issues between OS and apps (vertical interoperability). OS can restrict the functionalities of apps by not granting access to the essential APIs, such as APIs relating to wi-fi information or voice command functions.¹⁷ To compete on merits, rival players must have access to the same software and hardware features as gatekeepers. A regulatory framework that ensures that this access is provided on fair and reasonable standards to business users is essential to ensure the effectiveness of interoperability as a remedy.

Methodology

The research questions will be analysed through both doctrinal and qualitative empirical methods. The research will use comparative legal methodology to examine the relevant legal provisions, regulations, case laws, and regulatory models related to the implementation of interoperability in various jurisdictions. This is because the pertinent issues that the project sets to address relating to competition law, privacy, and consumer welfare transcend national borders, which makes applying comparative legal methodology essential to reassessing the underlying principles of law and regulation.

The qualitative empirical methods would include case studies of existing regulated models for interoperability. One such extensive case study would be on the UPI system. Further, the project will also refer to the open banking system in the UK and the EU as illustrations. The technical feasibility of applying the financial sector approach to interoperability in the digital markets would be assessed through semi-structured interviews with stakeholders such as software engineers in big-tech companies, researchers and professors from other universities and departments (computer science and engineering), representatives from competition authorities and technical experts from standard-setting organisations. The interviews would be semi-structured with pre-planned questions with a chance for the interviewee to elaborate on their views. Through this method, the thesis will attempt to bridge the divide by applying interoperability to digital markets from both law and technology perspectives.

¹⁷ Authority for Consumers and Markets, 'Market Study into Mobile App Stores', 11 April 2019, available at <https://www.acm.nl/sites/default/files/documents/2019-04/marktstudies-appstores.pdf>, accessed 5 February 2024, pg. 82.