



Foundations for an Open Mobile Ecosystem

Freedom of Choice Enabled by Interoperability

Open Digital Business Consortium
(ODBC)

August, 2026

Realizing an Open Digital Ecosystem and Promoting Innovation

The Open Digital Business Consortium (ODBC) is committed to fostering an open digital ecosystem that ensures consumers' freedom to choose safe and trustworthy digital services suited to the AI era.

To achieve this objective, we focus on competition-related challenges in the digital domain—particularly in the mobile sector—and work collaboratively across industries with governments, experts, and a broad range of stakeholders to build a fair and transparent competitive environment.

We also aim to promote innovation by enabling seamless connectivity and comprehensive operating system's interoperability and its interoperability with other peripheral devices, and by encouraging synergistic partnerships and open ecosystem that transcend industries and national borders.

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Executive Summary

The Case for Smartphone OS Interoperability: Evidence from Japanese Consumers

A comprehensive consumer survey conducted in February 2026 reveals strong public demand for improved interoperability between smartphone operating systems and between smartphones and other devices, alongside clear evidence that current ecosystem barriers may limit consumer choice and market competition.

Key Findings

Consumers Overwhelmingly Support Interoperability

A majority of users (56.4%) believe that manufacturers should design their devices to connect seamlessly with products from other companies (Q4_1) .

This sentiment reflects growing consumer frustration with artificial barriers that limit how they use and share across platforms and devices. Nearly half of all respondents (43.7%) rate interoperability as an important factor—a signal that the market is ready for change (Q3_1) .

Consumer Demand for Cross-Platform Functionality

Survey data demonstrates a clear, latent consumer demand for broader hardware and service compatibility, which is currently suppressed by ecosystem limitations.

- **Impact on Purchasing Behavior:** If interoperability were guaranteed, **28.8%** of all respondents indicated their purchasing decisions for smartphones and peripheral devices would change. Among consumers who have previously attempted to connect devices from different manufacturers, this figure rises to over **50%** (Q3_14).
- **Drivers of Demand:** The primary motivators for this behavioral shift are equal utility and expanded market choice. Specifically, **49.7%** of respondents stated they expect cross-platform devices to operate with the same convenience as same-brand devices, while **47.6%** cited the desire for a wider range of product choices (Q3_15).

Ecosystem Lock-in is Suppressing Consumer Choice

One in four consumers (25%) report having avoided or hesitated to purchase a smartphone from a different manufacturer or operating system due to interoperability concerns (Q3_8) . The barriers are significant and multifaceted (Q3_9) :

- Data portability anxiety: 34.9% cite difficulty transferring data and settings as a primary deterrent
- Device connectivity concerns: 33.3% worry about losing seamless connections

between their existing devices

- Subscription lock-in: 32.1% fear losing access to current apps and services—rising to 41.4% among iOS users specifically

These barriers are compounded by social and household dynamics: approximately 40-50% of users report that all family members use the same operating system, creating peer pressure that reinforces platform loyalty rather than enabling genuine choice based on product merit.

Consumers Experience Real Harm from Poor Interoperability

Among users who have attempted cross-platform connectivity, the experience is frequently frustrating. Nearly three-quarters (74%) of users with cross-manufacturer device experience identified at least one function as unusable or difficult to use. Common pain points include pairing failures (39.2%), data transfer complications (36.8%), data and settings transfer is also a notable concern (20.2%) and limitations on photo and location sharing (19.1%) (Q3_2, Q3_4).

These are not abstract concerns—they represent daily friction that degrades the user experience and discourages the kind of experimentation and switching that drives healthy competition.

Improved Interoperability Would Unlock Consumer Freedom

The survey reveals significant latent demand currently suppressed by interoperability

barriers. Among users with cross-platform experience, more than half indicate their smartphone purchasing behavior would change if interoperability improved. The reasons are clear (Q3_15):

- 49.7% would benefit from equal convenience across manufacturers
- 47.6% would gain access to expanded product choices
- 27.3% could access new functions and technologies previously locked to other ecosystems
- 25.8% anticipate cost savings from increased competition

Public Support for Regulatory Action

The data reflects a strong consensus among consumers that manufacturers have a responsibility to ensure cross-platform compatibility, and there is clear support for regulatory frameworks to enforce this. A majority (**56.4%**) of respondents assert that "manufacturers should make their own devices and products connectable and linkable with other companies' products" (Q4_1).

In addition, Japanese consumers recognize that market forces alone have not delivered interoperability, and they support government intervention through Mobile Software Competition Act (MSCA). Nearly 40% of respondents agree with Japan's new smartphone law mandating improved interoperability, while opposition remains minimal at just 3.7%(Q4_2).

Conclusion

The evidence is clear: consumers want interoperability, they are harmed by its absence, and they support policy action to achieve it. Current ecosystem barriers do not reflect consumer preferences—they override them. By enabling seamless connectivity across platforms, policymakers can restore genuine consumer choice, stimulate competition, and ensure that success in the smartphone market is determined by innovation and value rather than lock-in effects.

Chapter 1. Introduction

1.1 Purpose of This White Paper

As digital technologies continue to evolve, consumers increasingly organize their daily lives around smartphones as the central interface of a complex and interconnected digital ecosystem. This ecosystem no longer includes only a device and its applications, but encompasses cloud services, subscription-based services, peripheral devices such as smartwatches, headphones, wearable devices, and smart trackers.

In such an environment, when the functions and interfaces provided by mobile operating systems (OS), such as iOS and Android , or by certain manufacturers, are not sufficiently open to third-party developers, fair competition among devices and services can be significantly constrained¹. For example, even peripheral devices manufactured by Japanese companies may face limitations when used across different operating systems, where everyday functions such as notifications, automatic connectivity, and data sharing are not fully available. As a result, consumer choice as well as price competition may be effectively limited, even where alternative products or services exist. These structural constraints act as a competition barrier and can reinforce market dependence on specific operating systems, manufacturers or platforms, thereby undermining consumer choice and innovation in the market.

¹ The Digital Markets Act (DMA) identifies network effects, user dependency, and lock-in effects as structural characteristics of core platform services. [4]

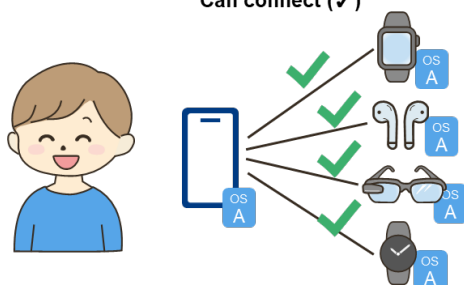
Against this backdrop, Japan enacted the Mobile Software Competition Act (MSCA), formally titled the Mobile Software Competition Act (Japan's Mobile Software Competition Act), to promote fair and open competition in the digital market centered on smartphones. The Act represents an important institutional response to competition concerns arising in mobile software ecosystems.

This white paper aims to reassess the current situation faced by Japanese consumers from the perspective of ensuring a Safe and Trustworthy Choice Environment. It examines challenges arising from restrictions to OS interoperability and data portability across devices², and analyzes the consumer and market value that could be realized if these issues were effectively addressed. Based on empirical evidence, the paper offers policy-oriented insights and recommendations directed at consumers, industry stakeholders, and government authorities.

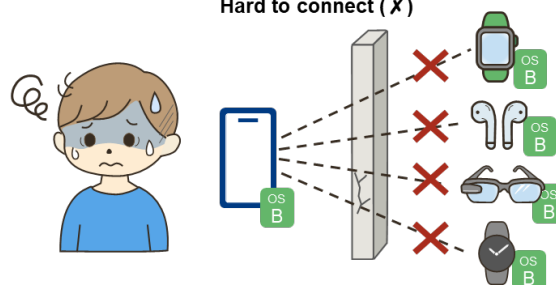
² "Data portability" in the context of this white paper is for users to be able to transfer data from one device to another device, as part of OS interoperability.

Interoperability: Devices Can Connect

Within the same OS and same manufacturer:
Can connect (✓)



Across different OSs and different manufacturer:
Hard to connect (✗)



Data Portability: Data Can Be Moved

Within the same OS and same manufacturer :
Can transfer data (✓)



Across different OSs and different manufacturer :
Migration is uncertain / requires effort (✗)

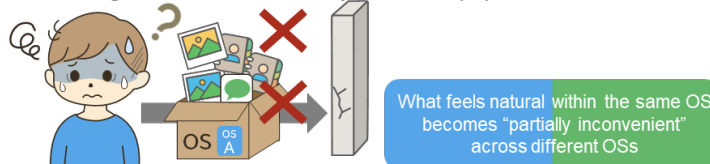


Figure 1.1 Conceptual Overview of Interoperability and Data Portability

1.2 The Need for a Safe and Trustworthy Choice Environment

Consumers should be able to freely choose the services and devices they use in relation to their smartphones, based on their own needs and values. This principle also constitutes a prerequisite for fair competition in digital markets, particularly in the mobile sector³.

However, experience in the mobile ecosystem has shown that consumer choice is not

³ Japan's Mobile Software Competition Act (MSCA) aims to enhance public welfare by promoting fair and free competition in mobile operating systems and related software. [1]

meaningfully ensured merely by the nominal existence of alternatives. For choice to be effective, consumers must be able to compare, switch, and use services across devices and platforms with confidence. In practice, this requires an environment in which consumers can migrate or combine services without undue friction, uncertainty, or hidden costs.

In the absence of such conditions, limitations related to OS interoperability and data portability across devices can discourage consumers from considering alternative products or services, even when those alternatives may better suit their preferences. Ensuring a safe and trustworthy choice environment is therefore essential not only for consumer welfare but also for sustaining fair competition and innovation in digital markets.

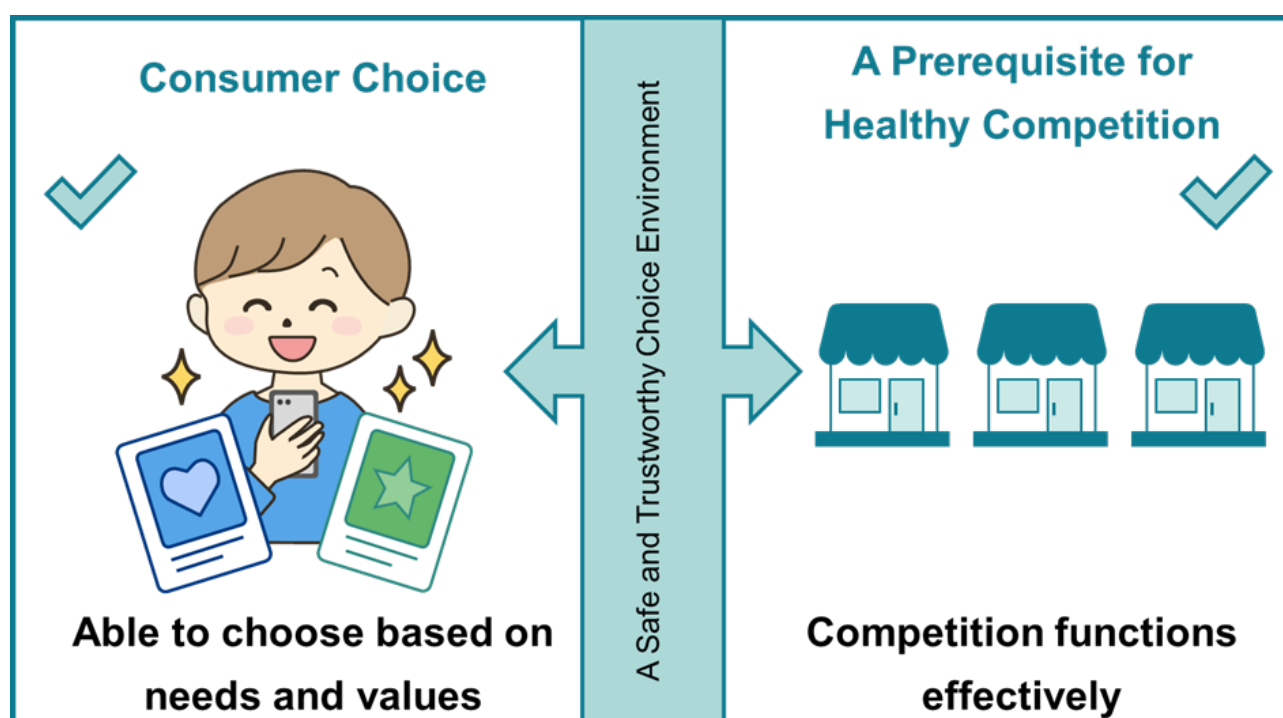


Figure 1.2 The Importance of a Safe and Trustworthy Choice Environment

1.3 The Role and Position of ODBC

In this context, ODBC focuses on competition-related challenges in the digital domain—particularly in the mobile sector—by promoting seamless connectivity and comprehensive interoperability that are not dependent on specific operating systems, platforms or manufacturers. Through cross-industry and cross-border collaboration, ODBC seeks to support innovation and sustainable market development.

From ODBC’s perspective, OS interoperability and data portability across devices should be regarded as foundational conditions supporting consumer choice and fair competition. They should, in principle, be available free of charge and without unreasonable restrictions or frictions, rather than treated as optional or discretionary benefits subject to unilateral business decisions.

1.4 Overview of the Consumer Survey

This white paper does not seek to evaluate or compare individual companies or technologies. Instead, it draws on empirical findings obtained through a consumer survey conducted in February 2026, with the aim of providing constructive insights for industry and policymaking.

ODBC positions this paper as an effort to complement policy discussions—often conducted at the level of legal frameworks or principles—by grounding them in observed consumer behavior and perceptions. The consumer survey was designed, conducted, and analyzed by Mitsubishi Research Institute, Inc.

To this end, this white paper incorporates findings from a consumer survey conducted in February 2026 to assess actual usage patterns and perceptions related to smartphones and connected devices. The survey targeted 1,100 respondents residing in Japan, aged between 15 and 69 years, with balanced allocation by gender, age group, and smartphone operating system.

The survey results serve as part of the empirical basis for the analysis presented in this paper, particularly in identifying consumer awareness, perceived inconvenience, and behavioral responses related to limitations in OS Interoperability and Data Portability.

Item	Description								
Purpose of the survey	To examine consumer awareness and perceptions regarding interoperability and data portability among smartphone devices, peripheral devices, subscriptions, applications, and related services provided by different manufacturers								
Methodology	Online Survey								
Sample size	Users of smartphone platforms (iOS / Android) 1,100 respondents								
Survey content	Awareness and perceptions related to device and service interoperability, as well as smartphone data transfer and compatibility								
Demographic criteria	Gender (male / female), Age groups (teens to 60s)								
			10s (15~19)	20s (20~29)	30s (30~39)	40s (40~49)	50s (50~59)	60s (60~69)	Total
	Male	iOS	25	50	50	50	50	50	225
		Android	25	50	50	50	50	50	225
	Female	iOS	25	50	50	50	50	50	225
		Android	25	50	50	50	50	50	225
	Total		100	200	200	200	200	200	1,100
Survey period	February 2026								

Figure 1.3 Overview of the Consumer Survey

In analyzing the survey results, weighted aggregation was applied by gender, age group, and smartphone operating system used. For gender and age group, population shares were set based on national census data, while for smartphone operating systems,

population shares were set based on the gender- and age-specific response distribution obtained in a pre-survey.

All percentages presented in this document are based on weighted data. However, the number of observations (N) is reported based on the actual number of responses, even when weighted data are used.

The results of this survey constitute part of the empirical foundation for the analysis presented in this paper, and are used in particular to examine consumer awareness, perceived inconvenience, and behavioral changes related to limitations in OS interoperability and data portability.

1.5 International Developments on OS Interoperability and Data Portability

Discussions surrounding OS interoperability and data portability have gained momentum across multiple jurisdictions.

In the European Union, the Digital Markets Act (DMA) explicitly positions OS interoperability and data portability as core elements of competition policy. Article 6(7) of the DMA imposes obligations on designated gatekeepers to ensure that third-party hardware and services can effectively interoperate with the operating system, free of charge⁴. In March 2025, the European Commission adopted implementing decisions

⁴ Article 6(7) of the DMA requires designated gatekeepers providing operating systems to ensure that third-party hardware and services can effectively interoperate with those operating systems. [4][5]

specifying concrete technical requirements and deadlines for access to key OS-level functionalities, marking a significant shift from abstract principles to enforceable obligations⁵.

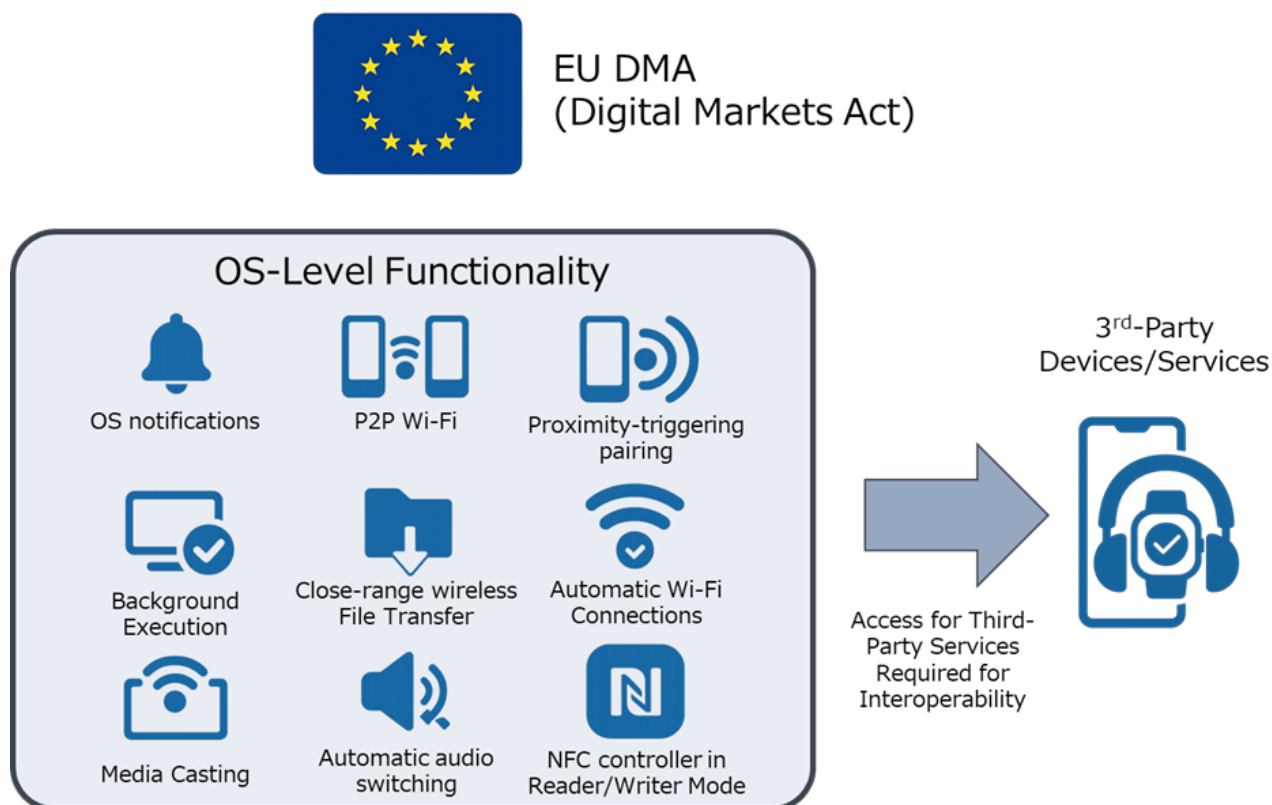


Figure 1.4 OS-Level Interoperability Obligations under the EU DMA

While the United States has not adopted a comprehensive legislative framework that

⁵ On 19 March 2025, the European Commission adopted implementing decisions pursuant to Article 6(7) of the DMA, specifying concrete measures to improve access to nine core operating system functionalities for connected devices. [6][7]

mandates OS Interoperability as an independent policy objective, its market openness has often been addressed through competition enforcement under antitrust law, with remedies typically emerging on a case-by-case basis.

Recent litigation has alleged that, across digital markets including the mobile sector, control over app distribution and access to OS functionalities hinders cross-platform service deployment and the development of complementary devices and digital services, ultimately limiting consumer choice and making switching more difficult.

While these remedies do not typically mandate specific interoperability features ex ante, they can nonetheless produce “indirect market opening” effects by expanding opportunities for rivals to enter the market and for services to interconnect.

In this respect, the U.S. approach differs from ex ante regulation such as the EU’s DMA: market opening is achieved in a limited and incremental manner through ex post judicial determinations in individual cases.

Other jurisdictions, including the United Kingdom⁶, are developing distinct regulatory frameworks that impose specific obligations on digital platforms. In the UK, for instance,

⁶ In the United Kingdom, the Digital Markets, Competition and Consumers Act (DMCCA) entered into force in January 2025. Under this framework, the Competition and Markets Authority (CMA) initiated investigations into mobile platforms, identifying interoperability as a key area of consideration. [8]

the Competition and Markets Authority (CMA) is moving forward with “Strategic Market Status” (SMS) designations for the mobile ecosystems of Apple and Google under the DMCCA. This framework is designed as an approach distinct from the EU’s, identifying interoperability as a key area of consideration and incorporating its own specific measures to address these issues.

1.6 The MSCA and the Position of This White Paper

In Japan, the Mobile Software Competition Act was enacted by the National Diet in June 2024 and entered into force in December 2024⁷. The Act introduces an ex ante regulatory framework aimed at ensuring fair competition, expanding consumer choice, and promoting innovation in mobile software ecosystems.

The law empowers Japan's Fair Trade Commission (JFTC) to designate operators of smartphone operating systems and app stores as "Specified Software Operators" subject to enhanced obligations. It will bar designated providers of Mobile OS from preventing third party developers from using, to the equivalent level of performance, the same basic Mobile OS functions that designated providers use in their first party apps.

⁷ During the legislative process of Japan’s Mobile Software Competition Act, supplementary resolutions emphasized the need to balance the promotion of competition with considerations such as security and privacy, while avoiding excessive or disproportionate regulatory measures.

[3]

While the enactment and enforcement of the MSCA represent a significant institutional milestone, legal frameworks alone do not automatically transform consumer experiences or market structures. The effectiveness of the Act depends on how its principles are implemented in practice and how they are understood and utilized by industry participants, developers, and consumers.

This white paper situates itself within this transitional context. By analyzing consumer survey data and highlighting both visible and latent constraints faced by users, it seeks to illustrate the practical implications of OS interoperability and data portability for the MSCA’s objectives. In doing so, the paper aims to contribute to informed policy dialogue and support the effective implementation of the Act.

Chapter 2. Current State and Challenges of the Mobile Market in Japan

This chapter examines the structural challenges observed in Japan's mobile market, focusing on how insufficient OS interoperability and data portability across devices, combined with psychological and social factors, constrain consumer choice and distort competitive conditions including price competition. The analysis highlights issues that are often difficult for consumers to recognize, yet have significant implications for market dynamics.

2.1 Lack of OS Interoperability and Data Portability and the Resulting Constraints on Consumer Choice

In practical terms, attempts to connect devices, applications, and cloud services across different smartphone operating systems and device manufacturers frequently encounter structural limitations. These constraints arise when mobile operating systems provide only limited access to functions and interfaces, making it difficult for developers to freely optimize or improve user experiences.⁸

Consumer Survey data demonstrates a clear, latent consumer demand for broader

⁸ Empirical research indicates that consumer lock-in in mobile markets is significantly influenced by switching costs and network effects. [11][12]

hardware and service compatibility, which is currently suppressed by ecosystem limitations.

Among users who have attempted cross-platform connectivity, the experience is frequently frustrating. Nearly three-quarters (74%) of users with cross-manufacturer device experience identified at least one function as unusable or difficult to use. Common pain points include pairing failures (39.2%), data transfer complications (36.8%), and limitations on photo and location sharing (19.1%).

If interoperability were guaranteed, **28.8%** of all respondents indicated their purchasing decisions for smartphones and peripheral devices would change. Among consumers who have previously attempted to connect devices from different manufacturers, this figure rises to over **50%** (Q3_14).

The primary motivators for this behavioral shift are equal utility and expanded market choice. Specifically, **49.7%** of respondents stated they expect cross-platform devices to operate with the same convenience as same-brand devices, while **47.6%** cited the desire for a wider range of product choices (Q3_15).

As a result, even when third-party developers identify opportunities to enhance usability—such as improving file sharing across platforms, synchronizing notifications, or enabling seamless interaction between smartphones and peripheral devices—they may be unable to implement such improvements due to operating system restrictions. This is particularly the case in areas where agreed industry standards and protocols already exist to address these longstanding interoperability issues in a safe and secure manner. Limitations on background execution further constrain the development of functions that

could otherwise enhance user convenience.

These constraints give rise to what can be described as “unavoidable inconvenience” for users. In everyday scenarios such as file sharing, device pairing, notification synchronization, payment functions, and subscription management, users may experience frustration without clearly understanding that the underlying cause lies in platform design rather than in their own actions or lack of familiarity.

Because the source of inconvenience is often invisible, users tend to internalize these experiences as “just the way things are.” This normalization of inconvenience reinforces dependency on specific platforms and strengthens ecosystem-level lock-in, reducing effective consumer choice and weakening competitive pressure.

From a market perspective, ensuring OS interoperability and data portability across devices is therefore essential infrastructure for a healthy digital market, enabling consumers to select services and devices freely and encouraging competition (including how devices are priced) based on value rather than platform dependency.

2.2 Reinforcement of Lock-in Through Psychological and Social Factors

The Interaction of Communication and Network Effects

For many consumers, decisions about digital devices are influenced not only by technical specifications or price, but also by social considerations—such as compatibility with family members, friends, or colleagues. In practice, using the same operating system as people in one’s immediate social circle avoids problems in messaging, photo sharing,

settings assistance, and informal troubleshooting, reinforcing the lock-in effect.

This phenomenon reflects classic network effects, whereby the value of a platform may increase as more users adopt it, potentially influencing user preferences and ecosystem choice. However, network effects are not unidirectional. In the digital economy, they can also be negative: as participation expands, congestion, complexity, reduced signal quality, or diminished user experience may arise, reducing the platform's overall value for its users.

Such negative network effects can create natural limits to platform growth, induce user churn, or require active intervention by platform providers. For this reason, digital platforms often invest in curation, moderation, and algorithmic filtering to manage these dynamics and sustain a balanced value proposition for participants.

Based on Consumer Survey results, these barriers are compounded by social and household dynamics: approximately 40-50% of users report that all family members use the same operating system, social dynamics that may reinforce platform loyalty, in some cases constraining switching decisions that would otherwise be based primarily on individual product assessment.

Brand Trust and Social Conformity

Long-term use of a particular brand or ecosystem can foster trust and emotional attachment, reflecting positive user experiences accumulated over time. Perceptions such as “many people use it” or “it is the industry standard” may also function as social

validation, and in many cases can be understood as a natural outcome of fair competition.

At the same time, these social dynamics can contribute to consumer lock-in in ways that are not always driven by objective differences between products or services. In particular, simplified assumptions or misconceptions—such as equating ecosystem closure with superior safety or compatibility—may discourage consumers from considering alternatives, even where viable options exist. As a result, consumer choice may be constrained not only by competitive success, but also by information asymmetries and behavioral factors.

The Misconception That “Closed Means Secure”

Security and privacy are some of the most important considerations for consumers. However, the widespread assumption that systems managed in a closed manner are inherently safer has deepened psychological lock-in. This simplified narrative often leads to the perception that open systems or cross-platform connectivity are inherently risky. In reality, with appropriate technical safeguards—such as encryption, access controls, and robust data governance—secure interoperability is technically feasible. Nevertheless, when the “closed equals safe” assumption becomes socially entrenched, even technically achievable and consumer-beneficial connections may be excessively restricted.

The Role of Risk-Emphasizing Warnings

Purported security warnings and privacy explanations play a vital role in protecting users and ensuring they can make informed decisions. However, the design and tone of these communications can significantly influence consumer behavior. When such information is presented in a matter that creates undue friction or emphasizes uncertainty—particularly during transitions between different platforms or services or devices— it may discourage users from exploring or switching to competitive alternatives. Ensuring that these warnings are objective and balanced is essential to maintaining a fair digital environment where consumers feel confident in their choices.

Interoperability should, in principle, be advanced through market competition and technological innovation. However, where vertically integrated device manufacturers control essential components such as operating systems or key connectivity features while also providing complementary products or services, there is a structural risk that interoperability may be under-supplied by market forces alone.

In such circumstances, even where interoperability is technically feasible, business incentives may lead to limited or selective access for third parties. As a result, consumers may be constrained to usage patterns premised on dependence on a particular ecosystem, reinforcing psychological and social forms of lock-in and restricting effective choice.⁹

⁹ Vertically integrated firms that control essential components such as operating systems or core

Q1_6 Household smartphone usage by OS

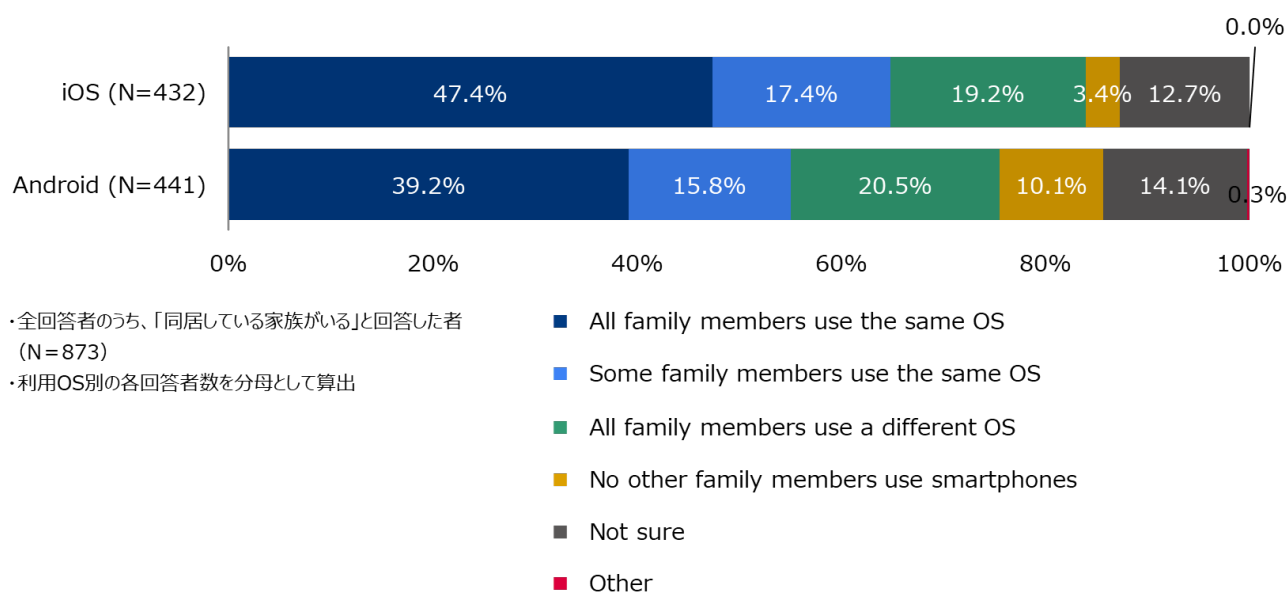


Figure 2.1 Household Device Ecosystem (by Smartphone OS)

connectivity features may have incentives to under-provide interoperability, even where it is technically feasible. [10][11]

Q3_5 Key Factors in Smartphone Purchase Decisions(Score of 6 or higher = "Important")

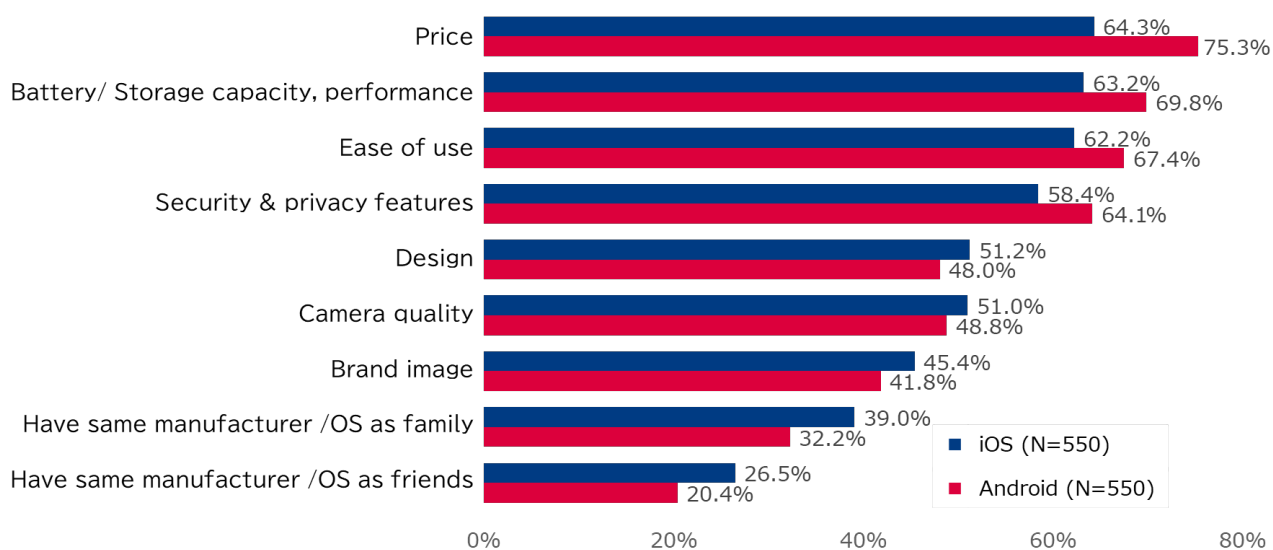


Figure 2.2 Key Factors in Smartphone Purchase Decisions

Q3_6 Do you feel trust or psychological attachment to a specific OS,including its security features?

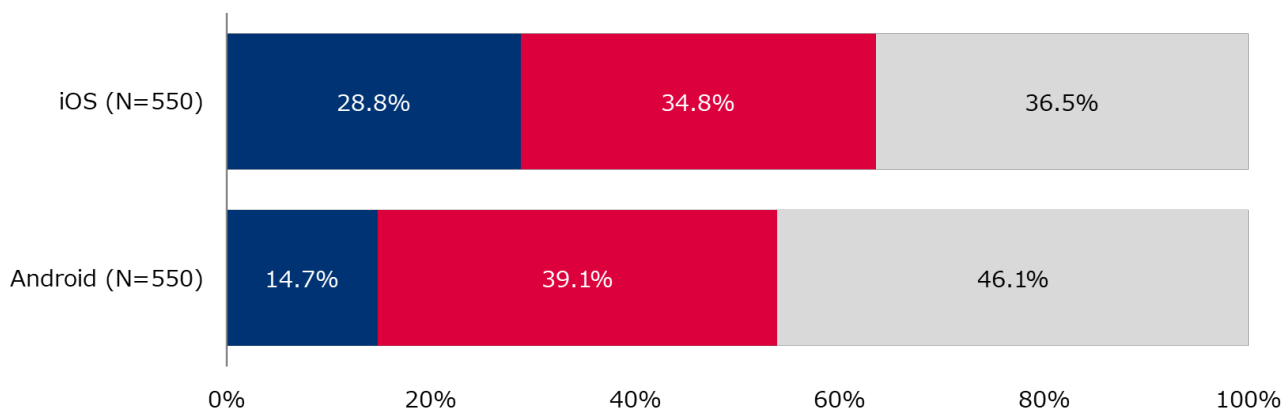


Figure 2.3 Trust and Psychological Lock-in to a Specific OS

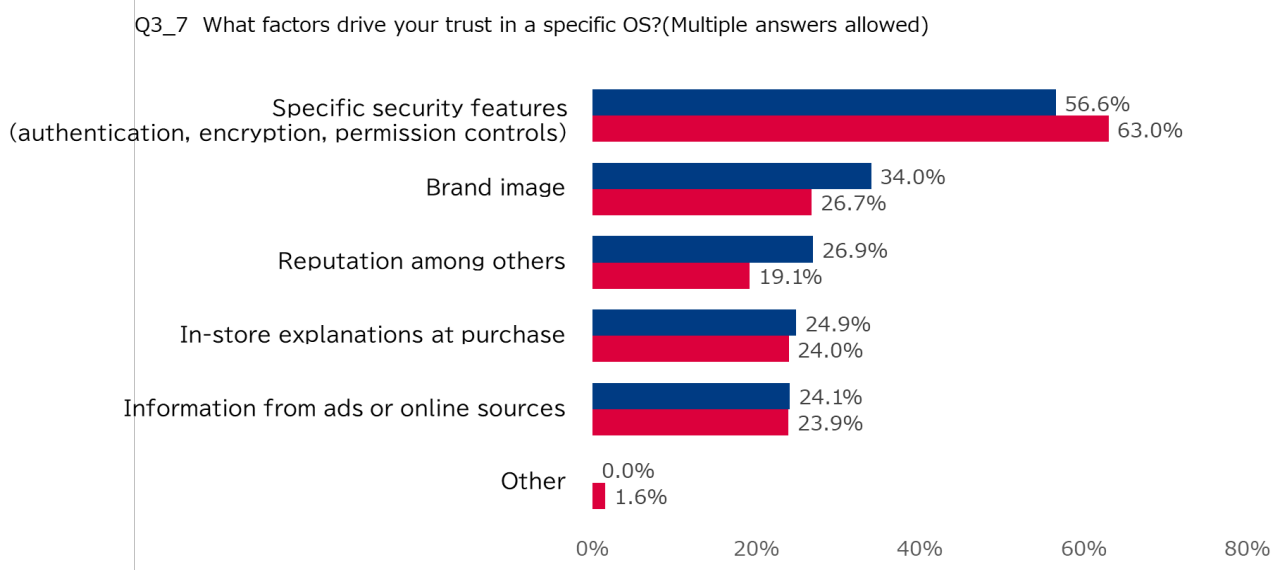


Figure 2.4 Reasons for Trust in a Specific OS

2.3 Unfair Competitive Conditions Affecting Developers, Markets, and Users

Insufficient interoperability not only affects user experience, but also creates asymmetric competitive conditions among service providers. In particular, disparities often arise between platform operators providing first-party services and external third-party providers.

Third-party developers are inherently dependent on platform specifications, implementation decisions, and available interfaces. Their ability to offer innovative products or services is constrained when access to system functions is limited, delayed, or conditional. By contrast, first-party services may enjoy broader access to system-level functions and greater design flexibility.

As a consequence, even when third-party developers possess superior ideas or technologies, they may be unable to offer functionality or usability comparable to first-party services. This distorts competition, suppresses incentives to innovate new software and devices, and deprives consumers of the benefits that competition would otherwise deliver.

From a competition policy perspective, OS interoperability and data portability across devices should therefore be ensured, in principle, free of charge and without unreasonable restrictions or any frictions. Failure to do so risks entrenching structural asymmetries and perpetuating reduced consumer choice and innovation.

Such unfair competitive conditions are not effectively remedied merely because

interoperability or data portability is formally made available, if access is subject to fees or constrained in terms of functionality, performance, or timing. In particular, where third-party providers are required to bear costs in order to achieve interoperability, or where their access to functions or usage conditions is more limited than that of first-party services, third-party providers are placed at a competitive disadvantage. As a result, competition-driven improvements and innovation are undermined.

From the perspective of ensuring a fair competitive environment, it is therefore important that interoperability and data portability be ensured, in principle, free of charge and without unreasonable technical or contractual restrictions. Otherwise, determining what constitutes an “appropriate” or “optimal” level of fees would require prolonged examination and negotiation. Given that the ability to bear such costs varies significantly depending on the scale and financial capacity of the parties concerned, competitive distortions would in practice be preserved, ultimately leading to a continued erosion of consumer choice and convenience.

In recent years, as the use of AI-based services and next-generation devices has expanded, differences may also emerge in the functions and user experiences available depending on the operating system or platform. This raises the risk that users may not equally benefit from the same technological advancements, depending on the platform they rely on.

Absent a free and fair competitive environment, first-party platform services are likely to become structurally entrenched in an advantageous position, resulting in a loss of diversity in market choice and innovation. Addressing such risks constitutes a core

concern of competition law and competition policy, which are expected to respond swiftly and rigorously to such challenges. This concern also forms one of the underlying policy rationales for the enactment of Japan's MSCA.

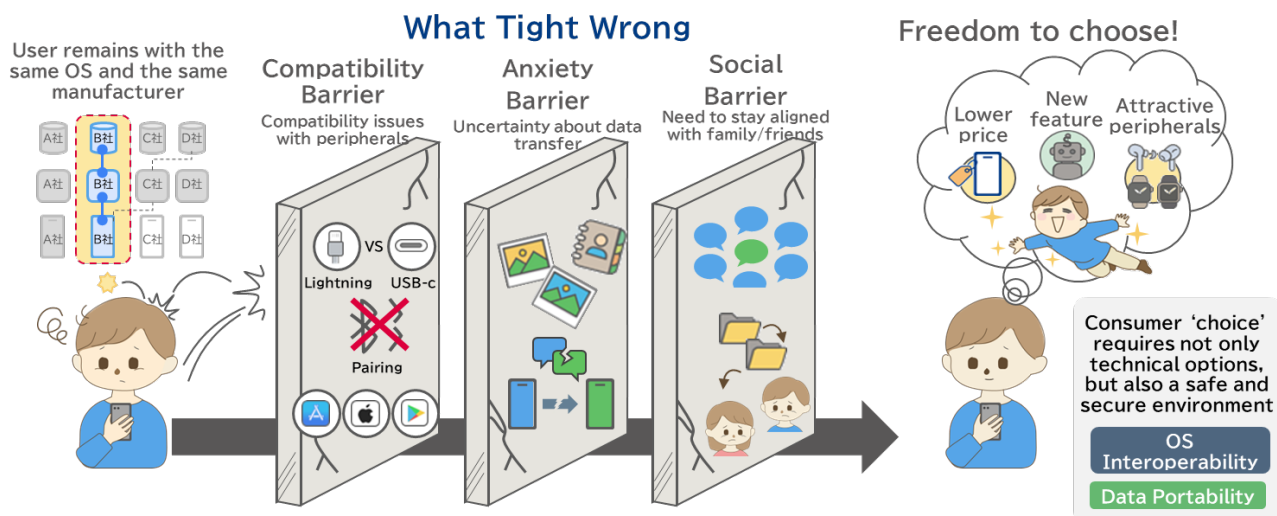
2.4 The Misperception That Differences Are “Natural” and Unavoidable

The technical, psychological, and social lock-in mechanisms discussed above are not always consciously recognized by consumers. In many cases, inconvenience is experienced as isolated incidents, while the underlying structural causes remain opaque.

When consumers use third-party products and experience inferior usability compared with first-party alternatives, these differences are often accepted as natural or inevitable. In many cases, the root cause is not the quality of the third party product itself, but limitations in interoperability—i.e., platform restrictions that prevent third parties from achieving the same level of cross platform functionality and performance as first party services.

As a result, consumers tend to accept existing conditions and avoid switching platforms, further reinforcing lock-in. This dynamic contributes to the persistence of market structures in which limited OS interoperability is normalized, despite its adverse effects on competition and consumer welfare.

It Feels Like Choice, but the Reality is Different



Inconvenience is structural, Not Your Fault

Figure 2.5 Inconveniences Caused by the Lack of Interoperability

Chapter 3. Consumer Survey Findings

3.1 Awareness and Perceived Importance of OS Interoperability

Before examining awareness of the term, it is important to note that the survey indicates broad consumer support for cross-ecosystem usability. A majority of respondents (56.4%) agree that manufacturers should ensure their devices connect seamlessly with products from other companies. At the same time, while 43.7% cite interoperability as an important factor in purchasing decisions.

The consumer survey reveals a notable gap between the perceived importance of cross-platform connectivity and awareness of the concept of interoperability itself. While many consumers intuitively recognize the value of being able to use devices and services across different operating systems, familiarity with the term interoperability and its underlying concept remains limited.

This finding suggests that OS interoperability is experienced by consumers primarily as a practical concern rather than as an articulated policy or technical concept. In other words, consumers tend to recognize its importance implicitly—through everyday usage scenarios—without necessarily understanding or naming the structural factors that shape their experiences.

This lack of conceptual awareness has important implications. When OS interoperability is not clearly understood as a systemic condition, limitations in cross-platform functionality may be perceived as unavoidable differences between operating systems, rather than as issues that can be addressed through policy, design, or market

mechanisms.

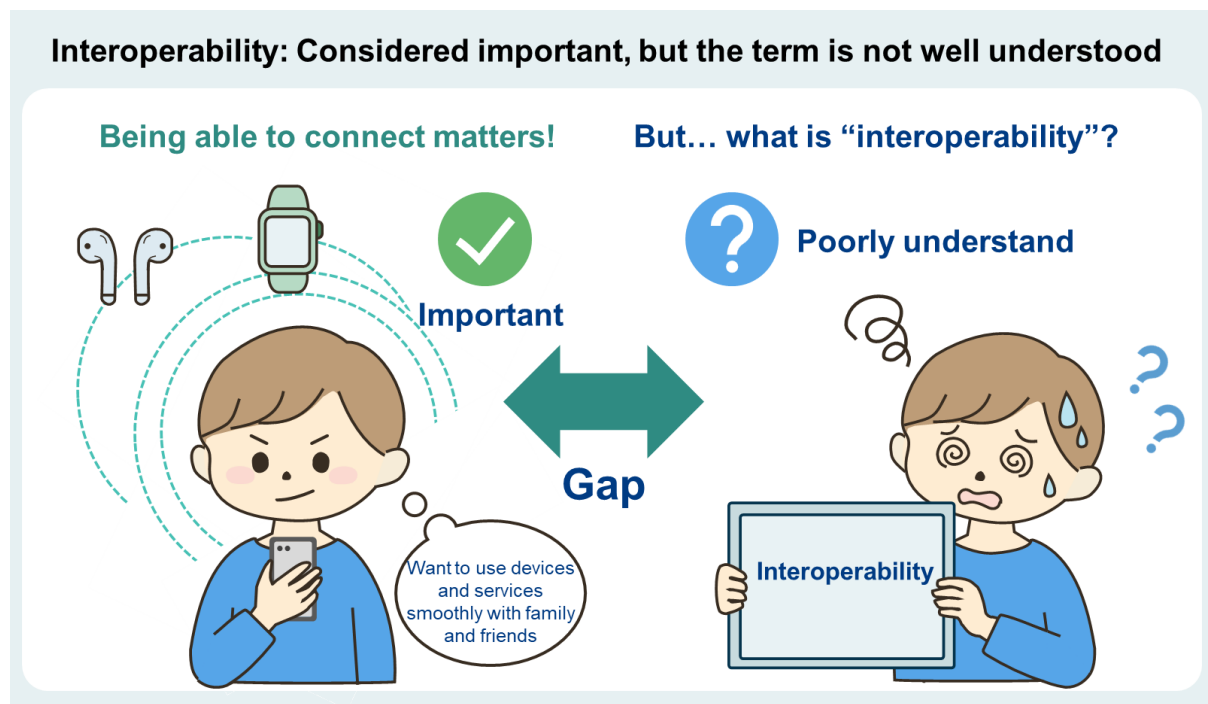
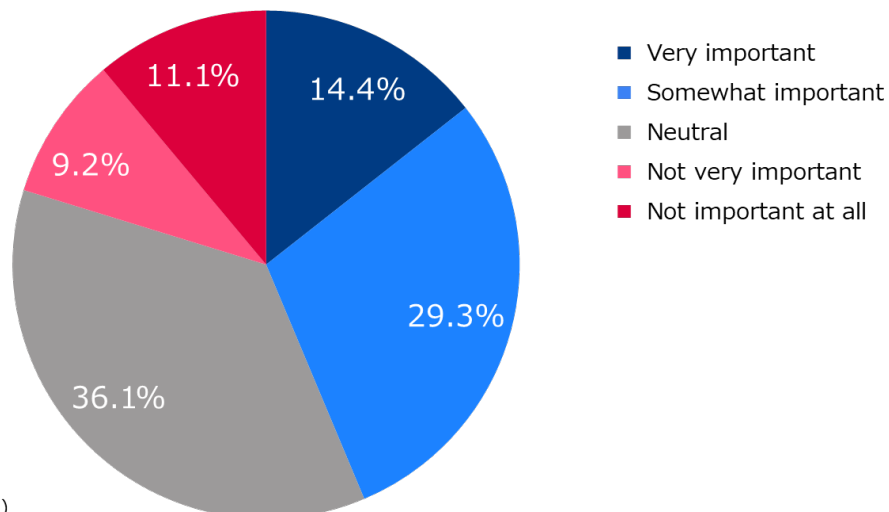


Figure 3.1 Interoperability is Considered Important but Poorly Understood

Q3_1 How important is interoperability between smartphones and devices from different brands or OSs?



Q2_3 How familiar are you with the concept of interoperability between devices from different brands or OSs?

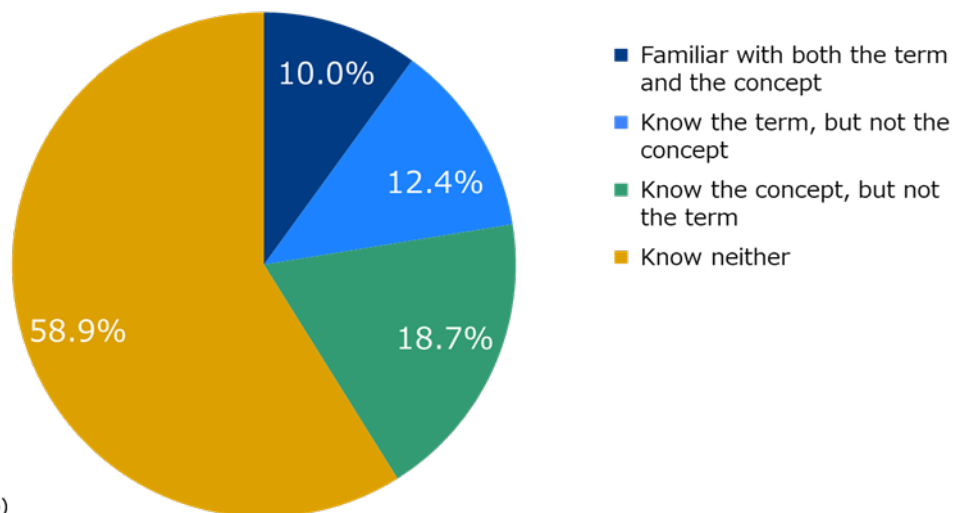


Figure 3.2 Perceived Importance of Interoperability

3.2 Specific Areas of Inconvenience

The survey results indicate that consumers who attempt to connect devices or services across different manufacturers or operating systems often encounter functional limitations attributable to insufficient interoperability and data portability. These limitations most commonly arise in areas such as data and settings migration, device pairing, and file sharing or data transfer between devices.

At the same time, the overall incidence of reported inconvenience or trouble appears relatively limited when viewed across the entire respondent population. This should not be interpreted as evidence that OS interoperability issues are rare or insignificant. Rather, it reflects the fact that many consumers have limited experience attempting cross-platform usage in the first place.

Among respondents who reported having attempted to connect or use devices and services across different operating systems at least once, a substantial majority indicated that they experienced at least one function that was “not usable” or “difficult to use.” Moreover, more than half of these respondents reported having encountered inconvenience or trouble related to such attempts.

By contrast, respondents who reported no experience with cross-platform connectivity were significantly more likely to report that they had never encountered unusable functions or inconvenience. This contrast suggests that interoperability-related inconvenience is not exceptional, but rather becomes apparent once consumers attempt to move beyond a single ecosystem.

These findings underscore that the lack of OS interoperability represents a structural constraint that manifests with high probability when devices or services from providers other than vertically integrated OS usage is attempted, even if it remains latent for consumers who avoid such attempts altogether.

[Left] Which functions are difficult or impossible to use across different manufacturers or operating systems? (N=1100)
[Right] Which problems have you experienced when connecting devices across different manufacturers or operating systems? (N=266)

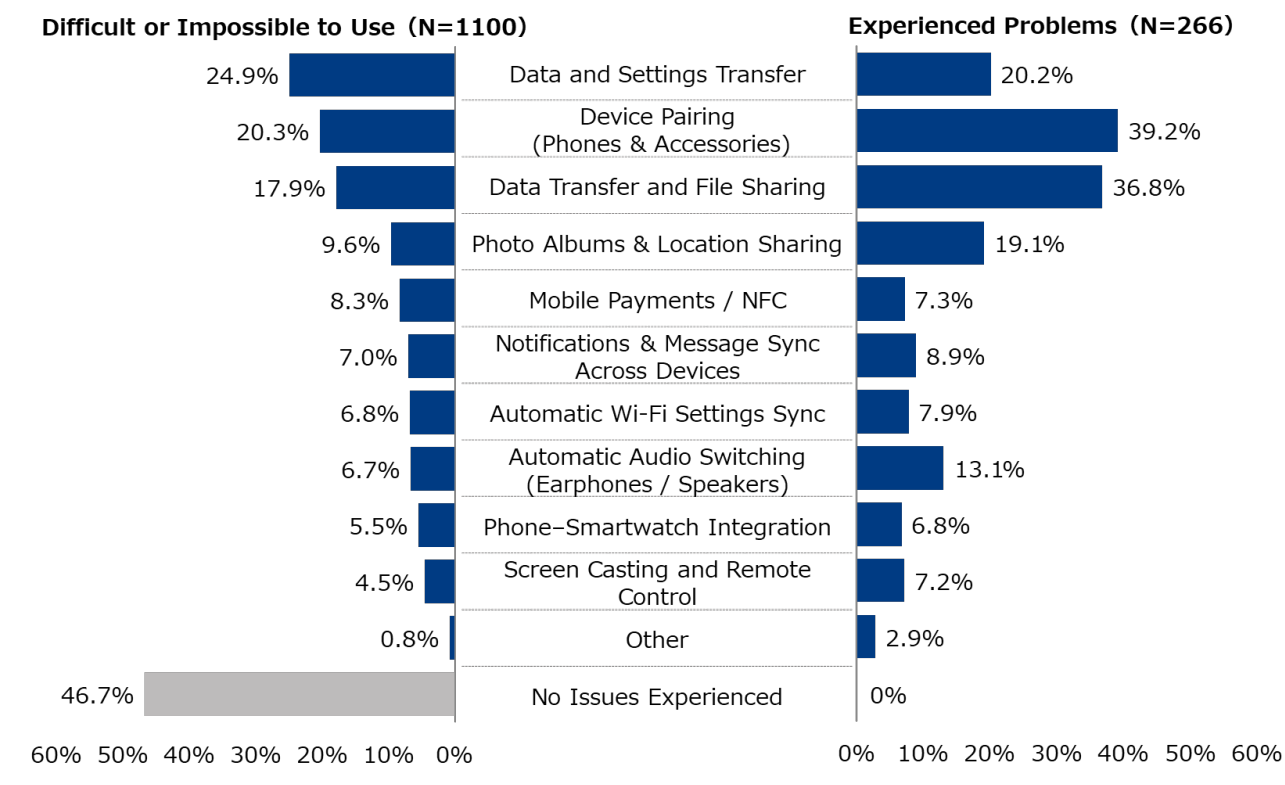
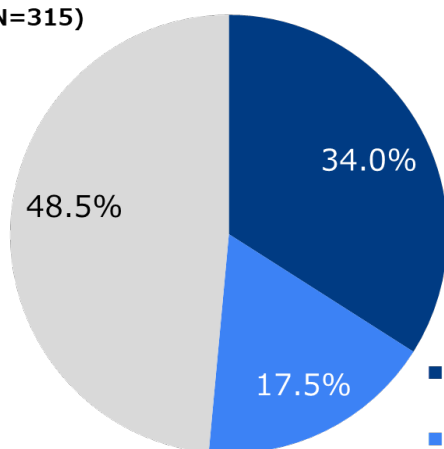


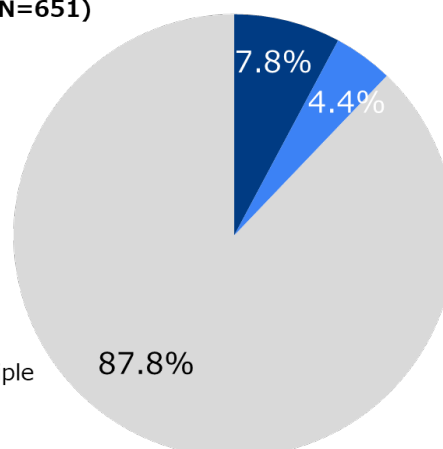
Figure 3.3 Interoperability Issues Across Devices and Operating Systems

Q3_3 Have you experienced inconvenience or problems when connecting smartphones or accessories from different brands or OSs?

**Have connected devices across brands
(N=315)**



**Have not connected devices across brands
(N=651)**



■ Experienced multiple times
■ Experienced once
■ No issues experienced

Figure 3.4 Experience of Hesitating to Switch Smartphone OS

3.3 Factors Discouraging Operating System Switching

The survey indicates that the primary reason for hesitation to purchase or switch to devices using a different operating system is not related to product price or technical specifications, but to uncertainty and perceived burden associated with switching for these users.

Specifically, respondents identified concerns regarding whether new devices would connect properly with existing devices and services, whether ongoing subscriptions or applications could continue to be used, and whether data and settings could be migrated smoothly. These concerns reflect anticipated risks and effort costs rather than actual negative experiences in all cases.

The results suggest that decisions not to switch operating systems are often made preemptively, before consumers encounter concrete inconvenience. In this sense, limitations in interoperability and data portability function as psychological and precautionary barriers for some users, discouraging consumers from exploring alternative options even where those options may offer better alignment with their preferences.

Notably, many respondents expressed the view that interoperability and data portability should be available without additional cost. This perception indicates that consumers tend to regard such capabilities not as premium features, but as basic conditions that should reasonably be expected in the digital environment.

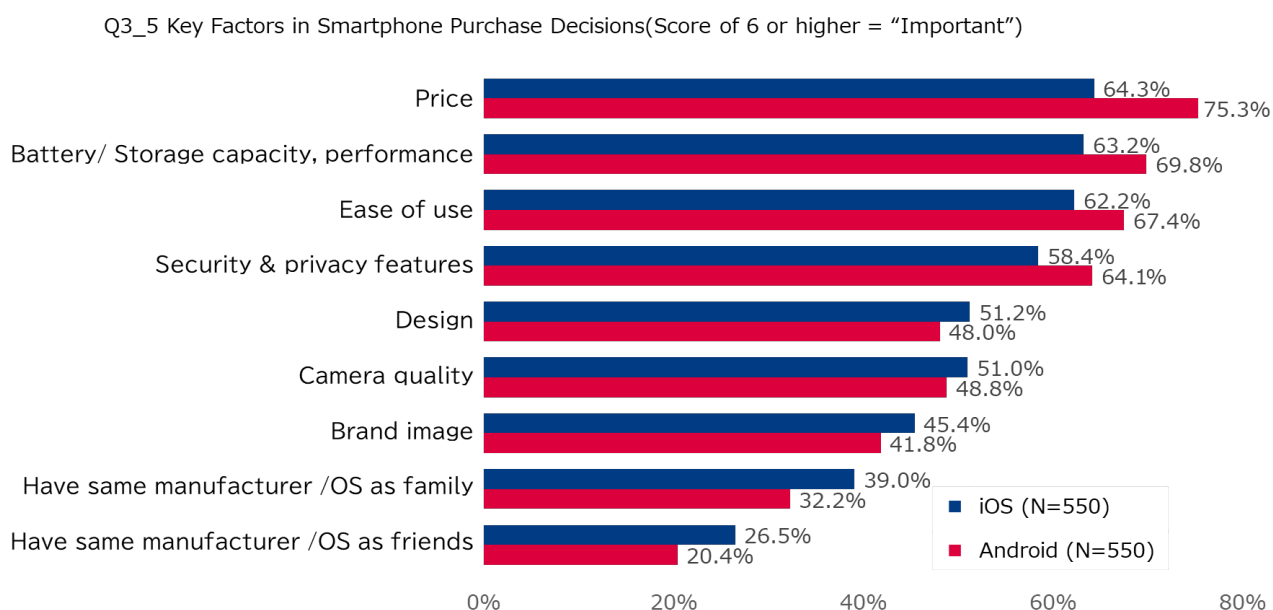


Figure 3.5 Key Factors in Smartphone Purchase Decisions

Q3_9 Why did you hesitate to switch to a different smartphone OS? (N=283)

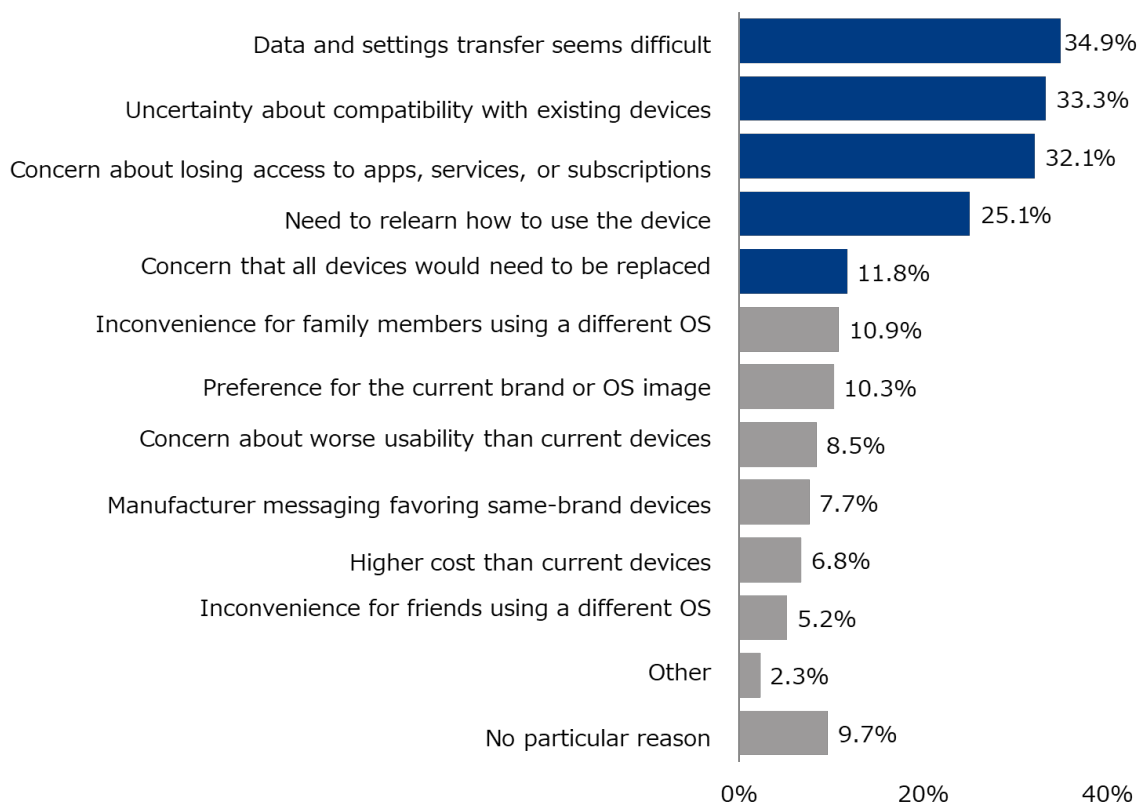


Figure 3.7 Reasons for Hesitating to Switch OS

3.4 Behavioral Changes Expected from Improved Interoperability

The survey results also point to the potential for meaningful changes in consumer behavior if OS interoperability were improved. A significant share of respondents indicated that enhanced cross-platform connectivity would influence how they choose smartphones and related devices.

However, the overall level of expected behavioral change remains moderate when viewed across the full sample. This is largely attributable to the fact that many

consumers lack direct experience with cross-platform usage and therefore find it difficult to anticipate how improved interoperability would affect their choices.

Importantly, respondents who reported prior experience connecting devices or services across different operating systems were substantially more likely to indicate that their purchasing and selection behavior would change if interoperability improved. This suggests that once consumers encounter interoperability-related inconvenience firsthand, they are more likely to recognize the value of improved conditions and adjust their behavior accordingly.

In addition, among users with cross-platform experience, more than half indicate their smartphone purchasing behavior would change if interoperability improved. The reasons are clear:

- 49.7% would benefit from equal convenience across manufacturers
- 47.6% would gain access to expanded product choices
- 27.3% could access new functions and technologies previously locked to other ecosystems
- 25.8% anticipate cost savings from increased competition

Taken together, these findings indicate that limitations in interoperability suppress not only current consumer choice but also latent demand. Improvements in interoperability and data portability could therefore unlock new patterns of consumer behavior, fostering more dynamic competition and greater diversity in device and service selection.

Q3_14 If smartphones and accessories worked seamlessly across different brands or OSs, would your choice of smartphone OS change? (N=1100)

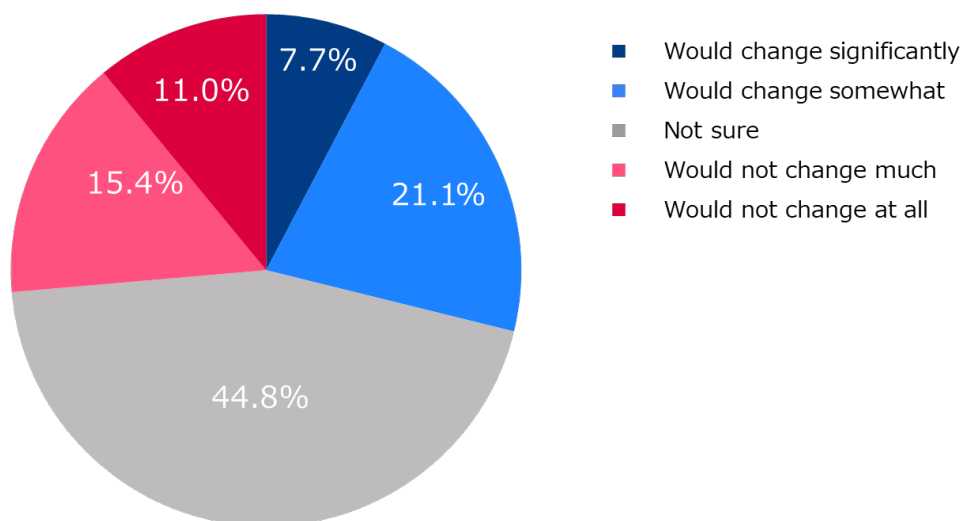
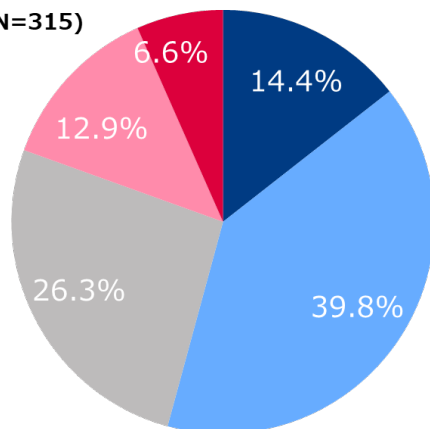


Figure 3.8 Impact of Improved Interoperability on OS Choice

Q3_14 If smartphones and accessories worked seamlessly across different brands or OSs, would your choice of smartphone or accessories change?

**Have connected devices across brands
(N=315)**



**Have not connected devices across brands
(N=651)**

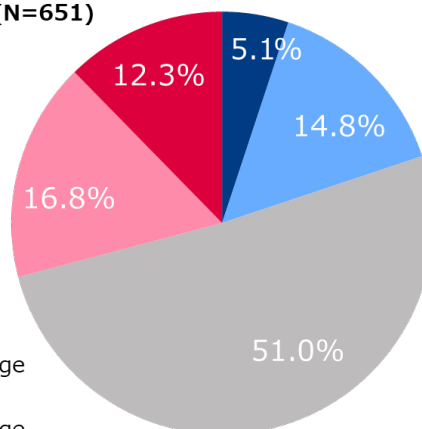


Figure 3.9 Impact of Interoperability on Device Choice (by Experience)

Q3_15 If devices worked seamlessly across brands or OSs, what new purchases or usage would you consider?
(N=302)

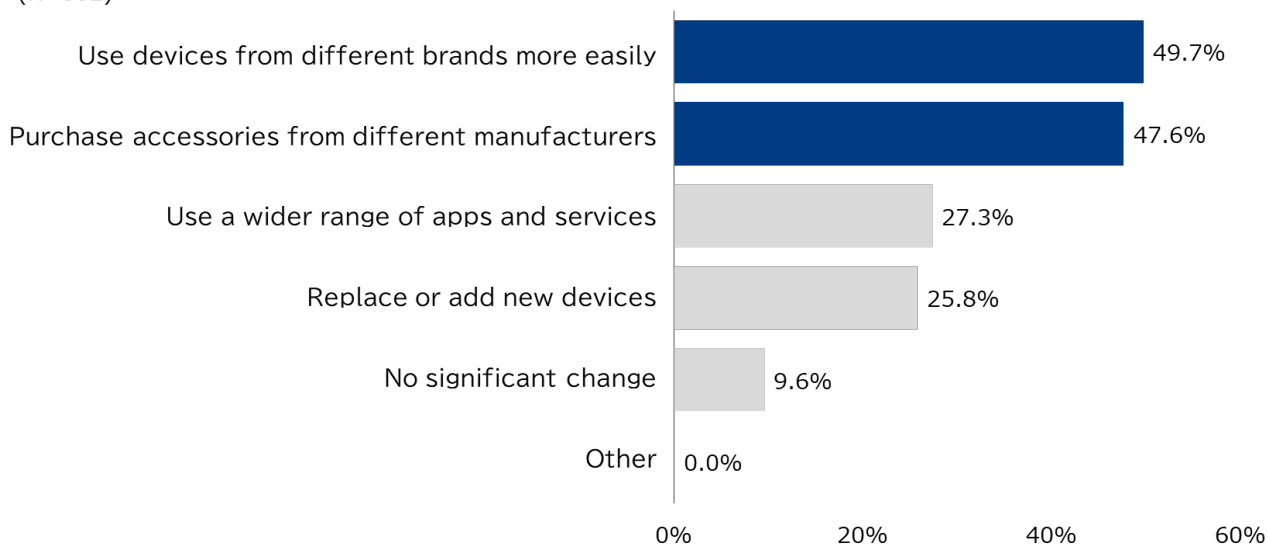


Figure 3.10 Potential Demand Enabled by Interoperability

Chapter 4. Value Created by Improved OS Interoperability and Data Portability

This chapter builds on the consumer survey findings presented in Chapter 3 and examines the value that improved OS interoperability and data portability across devices can deliver to consumers and the market. The analysis focuses not only on direct improvements in user experience, but also on broader implications for competition, innovation, and data-driven service development.

Enhancing OS interoperability generates value across multiple layers of the digital ecosystem, benefiting not only consumers but also complementary device and service providers, platform operators, and the wider economy.

For consumers, improved interoperability expands effective choice, leads to potentially lower prices due to competition, reduces switching and transaction costs, and enhances overall user experience. For complementary providers, it lowers barriers to entry and allows resources to be redirected from compatibility efforts toward genuine innovation, product differentiation and price competition. More broadly, interoperable ecosystems can serve as a foundation for spillover effects and unforeseen innovation, contributing to long-term economic efficiency and sustainable growth.¹⁰

¹⁰ Interoperability can expand consumer choice, lower switching costs, facilitate market entry for complementary providers, and generate broader economic benefits through innovation spillovers.

[10][11]

4.1 Restoring Consumer Choice and Improving User Experience

In closed digital ecosystems, constraints on consumer choice are not always perceived as explicit restrictions. When platforms are designed primarily to reinforce their own ecosystems, the use of third-party devices and services may be implicitly limited, even if such limitations are not clearly visible to users.

Improved OS interoperability mitigates these hidden constraints. When consumers are able to use devices and services across operating systems without significant friction, they can more freely compare and select products based on their own preferences. In everyday usage scenarios—such as file sharing, device pairing, subscription management, and notification handling—interoperability reduces the need for consumers to consider whether a given function will work across platforms.

Moreover, such openness serves not only convenience but also as a foundation for safeguarding societal security as a whole, including digital resilience. According to external research, 86% of experts report that open-source software is as secure as, or even more secure than, closed-source alternatives. This finding challenges the conventional misperception that security is ensured by closedness. Establishing interoperability and open standards not only guarantees affordable and diverse choices for consumers, but can also be regarded as an essential baseline for protecting users from increasingly sophisticated cyber threats.¹¹

¹¹ Voice of the Market: Android vs. iOS Security [13]

Enhanced OS interoperability and data portability also reduce unnecessary switching costs. These include not only financial costs associated with replacing devices, but also cognitive and procedural costs, such as learning new interfaces, reconfiguring settings, and migrating data. By lowering these barriers, consumers can make more flexible and rational choices, resulting in an overall improvement in user experience.

In this sense, OS interoperability and data portability function as enabling infrastructure that restores meaningful consumer choice, rather than as optional enhancements.

4.2 Promoting Competition and Stimulating Innovation in the Market

The opening of digital ecosystems through improved interoperability has significant implications for market competition. When consumers are no longer constrained by ecosystem boundaries, service providers face stronger incentives to compete on quality, usability, and value.

Such competition extends beyond price. It encompasses user interface design, reliability, service integration, and overall user experience. As competitive pressure intensifies, developers are encouraged to innovate not only incrementally, but also through new business models and service concepts.

Conversely, in environments where OS interoperability is limited by design or policy, structural asymmetries can arise between platform operators (first-party services) and external providers (third-party services). Platform operators may enjoy privileged access to system functions, data, or integration points that are unavailable to third parties,

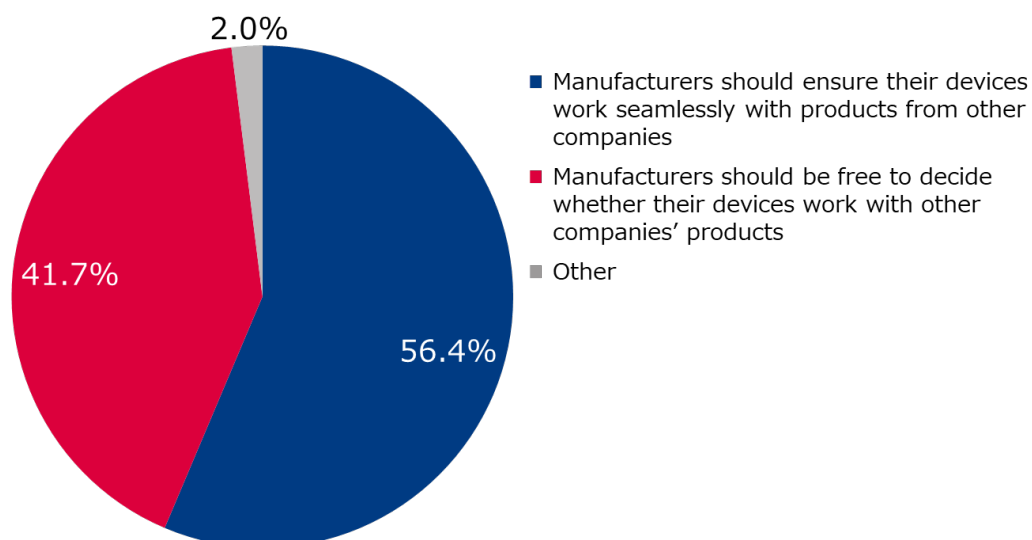
creating competitive advantages that are not readily visible to consumers.

Improving OS interoperability directly addresses these asymmetries by establishing a level playing field, in which all market participants can compete under comparable conditions. When access to core functionalities and data is available free of charge and without unreasonable restrictions, competition is more likely to be determined by the actual value offered to users rather than by structural advantages tied to platform control¹².

As a result, OS interoperability serves as a powerful mechanism for unlocking innovation and accelerating market dynamism.

¹² Guidelines issued by the Japan Fair Trade Commission and international competition policy reports note that fair competition in mobile operating systems can facilitate market entry, service innovation, and expanded consumer choice. [2]

Q4_1 Which statement best reflects your view on device interoperability? (N=1100)



Q4_2 To what extent do you support the view that manufacturers should ensure cross-brand compatibility? (N=1100)

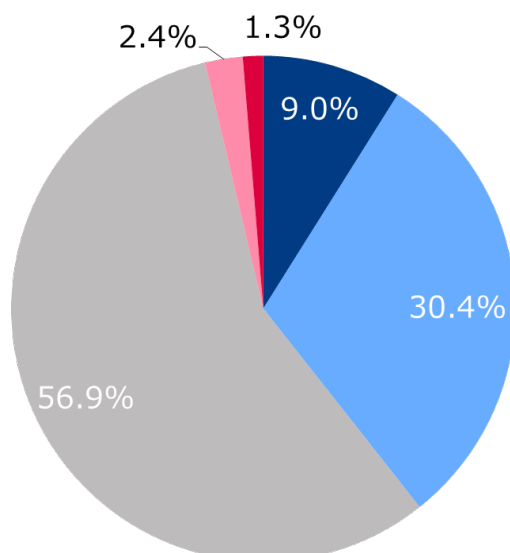


Figure 4.1 Expectations Toward Manufacturers

Chapter 5. ODBC's Vision and Recommendations

This chapter presents ODBC's vision for the future digital market, positioning OS interoperability and data portability not merely as regulatory compliance requirements, but as foundational social infrastructure that supports an open and sustainable digital ecosystem. It also outlines key messages directed at industry, government, and consumers.

The consumer survey identified a range of inconveniences experienced in cross-OS and cross-ecosystem use cases, including device pairing, data transfer and file sharing (such as interoperability between AirDrop and Quick Share), migration of data and settings regardless of storage location (cloud-based or on-device), NFC functionality, message synchronization, integration between smartphones and smartwatches and peripheral devices, synchronization of Wi-Fi settings, and automatic switching between audio devices. These areas show a high degree of alignment with the nine functions for which interoperability is mandated in the European Union, as discussed in Section 1.5.

Furthermore, while such limitations may not always be readily perceived by consumers, enabling third-party access to functions such as background execution and OS-level notifications would significantly expand opportunities for developers in terms of service design and new business models. These examples illustrate that the scope in which interoperability and data portability should be ensured extends beyond individual convenience features and has broader implications for the overall market structure.

ODBC views OS interoperability and data portability across devices not merely as matters of regulatory compliance or the opening of specific functions, but as essential social

infrastructure that underpins a sustainably open digital market. Accordingly, these capabilities should, as a general principle, be ensured on a free-of-charge basis and without unreasonable technical or contractual restrictions.

Moreover, enhancing interoperability in this manner is aligned with the policy objectives articulated by the Japanese government, including strengthening digital competitiveness and promoting innovation.

ODBC's Vision for the Future: Universal Connectivity and Data Portability

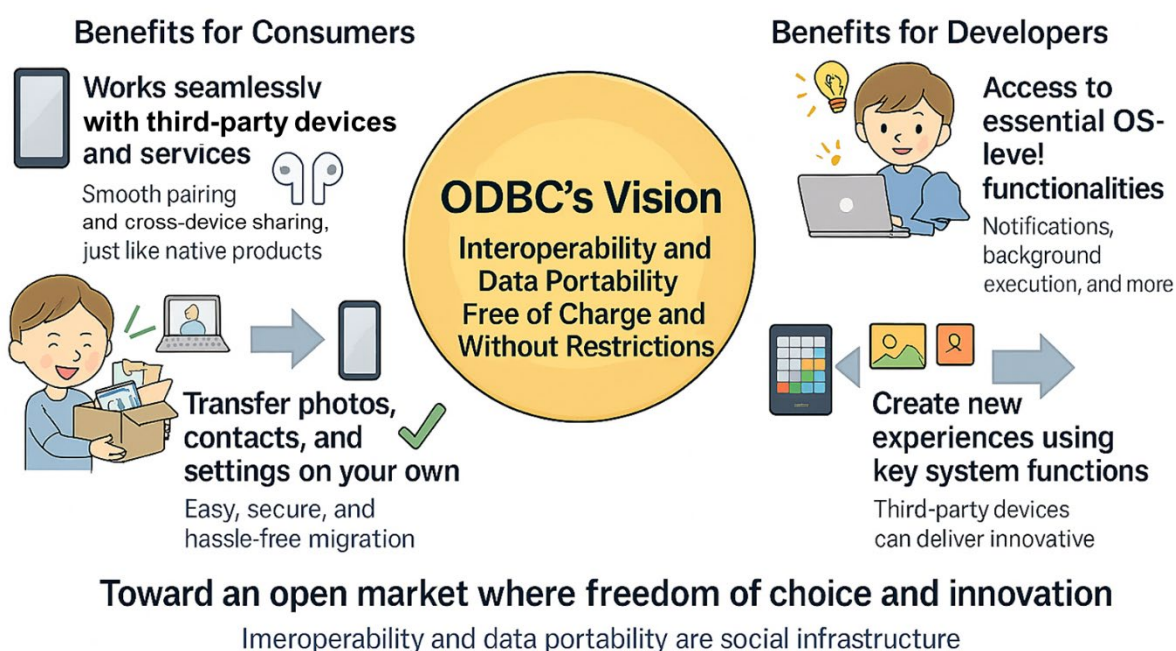


Figure 5.1 ODBC's Vision for the Future Digital Ecosystem

If interoperability and data portability are provided only on a paid basis, or are granted conditionally at the discretion of specific providers, the fairness of competitive conditions is undermined, and consumer choice and the potential for innovation are correspondingly constrained. Only when these capabilities are ensured free of charge and without undue

restrictions can a healthy and sustainable digital market be realized—one that benefits consumers, developers, and the industry as a whole.

Interoperability and data portability should not be treated as temporary or ad hoc measures tied to specific regulatory frameworks or technologies. Rather, they constitute foundational infrastructure that supports consumer choice, enhances firms’ competitive capabilities, and underpins trust in the market over the long term. From this perspective, ODBC calls for the continued development and implementation of institutional frameworks that enable an open and sustainable digital market.

5.1 ODBC’s Vision for the Digital Market

ODBC envisions a digital market in which consumers can choose products and services based on their own needs and values, without being unduly constrained by technological or ecosystem dependencies. In such a market, consumers would no longer feel compelled to consider whether devices or services will “work properly” when switching to a new smartphone or using products from different manufacturers.

Personal data accumulated through daily use—such as photos, contacts, settings, usage history, and subscriptions—would be treated as belonging to users themselves and would be transferable across operating systems and service providers. Consumers would not be locked into specific platforms simply because “many others use them,” but would instead be able to select devices and services that best match their preferences, enjoying user experiences comparable to those offered by first-party products.

This vision also represents a significant shift for industry participants, particularly developers and service providers. When OS interoperability and data portability are secured as baseline conditions, developers can deliver the value of their ideas and technologies directly to the market without excessive dependence on specific platforms. Services and use cases that were previously difficult to implement due to technical or contractual constraints can be designed more freely, allowing quality and innovation to be evaluated on their merits.

In such an environment, competition would be driven not by privileged access to platform-controlled functions, but by the ability to deliver meaningful value to users. OS interoperability and data portability thus serve as essential infrastructure that supports both consumer confidence and sustained innovation.

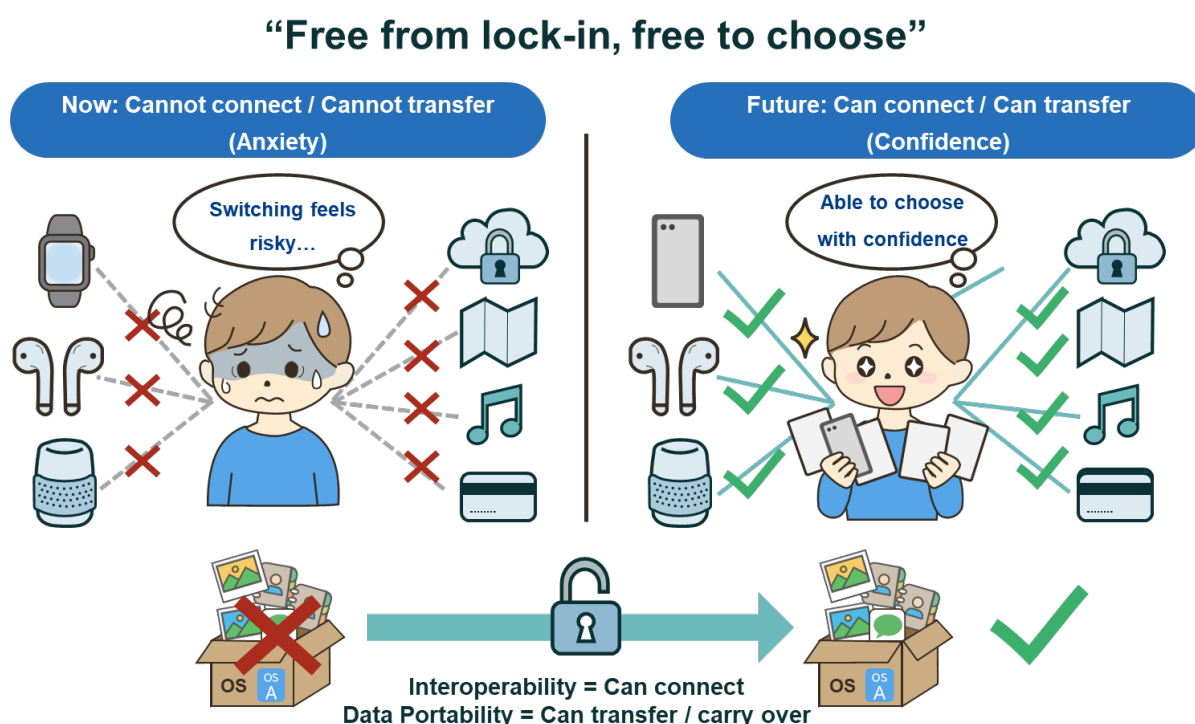


Figure 5.2 A Society Where Consumers Are Free to Choose

5.2 Rethinking the Relationship Between Security and Openness

Security and privacy are rightly among the most important considerations for consumers when selecting digital devices and services. These considerations do not inherently conflict with interoperability or competition; rather, they constitute necessary preconditions for a sustainable digital market.

However, as discussed earlier, a widely held assumption that “closed systems are safer” has often led to excessive restrictions on connectivity and openness. In practice, security is not achieved simply by limiting access points. A more robust approach is embodied in the principle of Security by Design¹³, whereby security considerations are embedded from the outset through appropriate access controls, permission management, user consent mechanisms, and auditability.

From this perspective, the principle that OS interoperability and data portability should be available free of charge and without unreasonable restrictions does not imply a disregard for security or privacy. On the contrary, systems that concentrate control over data and functionality within a single entity can limit opportunities for external scrutiny and improvement, potentially increasing risk rather than reducing it.

By enabling third-party participation under transparent and well-defined conditions,

¹³ “Security by Design” refers to an approach in which security considerations are embedded from the design and development stages, emphasizing transparency, accountability, and continuous risk mitigation. [9]

interoperability can facilitate continuous verification, competition-driven improvement, and accountability. When multiple actors are able to examine, test, and improve systems, security and usability can evolve in parallel rather than in opposition.

This understanding is further supported by external research¹⁴ indicating that 86% of security experts consider open-source software to be as secure as, or more secure than, closed-source alternatives. Closed architectures often rely on so-called “security by obscurity,” which has been widely criticized as ineffective against sophisticated attackers. By contrast, environments that allow diverse actors to continuously examine, test, and improve systems tend to enhance security and trust over time.

This is particularly true when leveraging the extensive work already undertaken by industry participants to establish the standards, protocols, and technologies that enable “secure by design” interoperability. While novel devices and services may pose greater technical challenges, priority should be given to the adoption of existing standards, with a commitment to developing new ones where they do not yet exist.

ODBC therefore regards security and openness not as mutually exclusive, but as complementary elements that, when properly designed and governed, reinforce trust in

¹⁴ While 86% of experts express support for the security of open-source software (OSS), closed architectures carry the risk of creating an “illusion of security” by making independent verification more difficult. It has also been noted that, against sophisticated attackers, a lack of design transparency can be counterproductive, potentially delaying the detection of compromises or intrusions. [13]

the digital market¹⁵.

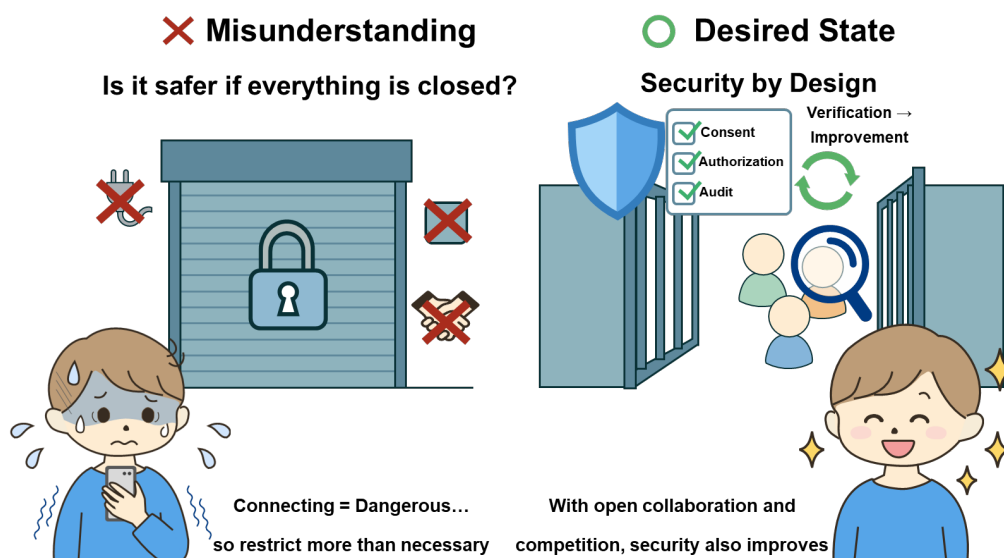


Figure 5.3 Security and Privacy Are Often Misunderstood

5.3 Messages to Industry, Government, and Consumers

An ecosystem centered on OS interoperability and data portability across devices cannot be realized through the efforts of a single company or sector alone. In today's digital markets—where mobile operating systems, peripheral devices, applications, cloud services, and AI services are deeply interconnected—cross-industry collaboration and a shared understanding among stakeholders are indispensable.

¹⁵ It has been noted that interoperability and security are not inherently in conflict; depending on how systems are designed and operated, openness can, through third-party scrutiny and verification, contribute to enhanced reliability and security. [11]

The results and analysis of the consumer survey presented in this white paper suggest that, when such collaboration is achieved, it can lead to tangible changes in consumer behavior as well as in overall market structures.

Based on the analysis set out in this white paper, ODBC believes that it is essential to steadily advance OS interoperability and data portability through both policy design and practical implementation.

Message to Industry

For industry participants—particularly platform operators—there is a growing need to move beyond the traditional assumption that closed architectures are necessary to ensure security and user experience. Open design should instead be viewed as a source of competitiveness.

Providing OS interoperability and data portability across devices free of charge and without unreasonable restrictions may be perceived as burdensome or risky in the short term. However, transparency and openness enable external validation and foster trust, contributing to long-term ecosystem value and resilience. Design efforts that reconcile openness with security can themselves become a competitive advantage.

Moreover, ongoing regulatory and market developments are gradually reducing long-standing asymmetries in competitive conditions. Developers and service providers that have previously faced limited opportunities due to platform constraints may gain new avenues to compete on equal terms with first-party offerings.

Industry actors should not wait passively for institutional change. Instead, they are encouraged to proactively invest in strategies, partnerships, and implementations that assume an open and interoperable environment. OS Interoperability should be recognized not only as a right to be exercised, but also as a responsibility to be upheld through secure and accountable design or by encouraging industry-standard security protocol.

ODBC seeks to collaborate with companies and organizations that share this perspective, advancing practical implementation, experimentation, and dialogue that contribute to both policy development and real-world outcomes.

Message to Government

For government authorities and policymakers, OS interoperability and data portability across devices should be positioned not merely as tools for competition promotion, but as foundational conditions that support consumer choice and long-term market health.

In designing and enforcing regulatory frameworks, it is important to avoid blanket restrictions justified solely on the grounds of security. Instead, policy should aim to enable openness and security to coexist through clear and proportionate rules. In particular, ensuring that OS interoperability and data portability are not rendered ineffective through pricing or excessive conditions is essential to preserving their practical value. This includes close scrutiny, at the enforcement stage, of practical and psychological frictions - such as user interface designs or warning messages - that

unduly discourage data portability or third-party device connectivity. Such scrutiny should, however, distinguish between design choices that lack objective justification and those that reflect legitimate interests in security, privacy, data integrity, or user safety, recognizing that some degree of friction may be inherent in - or even necessary for - responsible implementation of data portability or device interoperability.

Government's role extends beyond legislation. Continuous and accessible communication regarding the objectives, expected benefits, and practical implications of regulatory frameworks is critical—especially for businesses and developers that may not routinely engage with competition policy.

In the Japanese context, many companies with strengths in devices, components, software, and services may not be closely connected to policy discussions. Ensuring that regulatory frameworks are understood as shared infrastructure available to a broad range of stakeholders will be key to maximizing their positive impact on the market.

Message to Consumers

Consumers, too, are positioned at a point of transition. Traditionally, many have chosen devices based on widespread adoption within their social circles, equating popularity with convenience and safety. As OS interoperability improves, however, consumers will increasingly be able to select devices and services that align with their individual preferences without necessarily relying on first-party products and also reap benefits of meaningful price competition, without sacrificing usability or connectivity or affordability.

When consumers recognize and act upon these expanded choices, their decisions send important signals to the market. A fair, competitive and diverse digital ecosystem is supported not only by regulation and industry action, but also by informed consumer choice.

By reassessing habitual selection patterns and exploring alternatives made viable through improved OS interoperability and data portability, consumers can play an active role in shaping a more open, innovative, and trustworthy digital market.

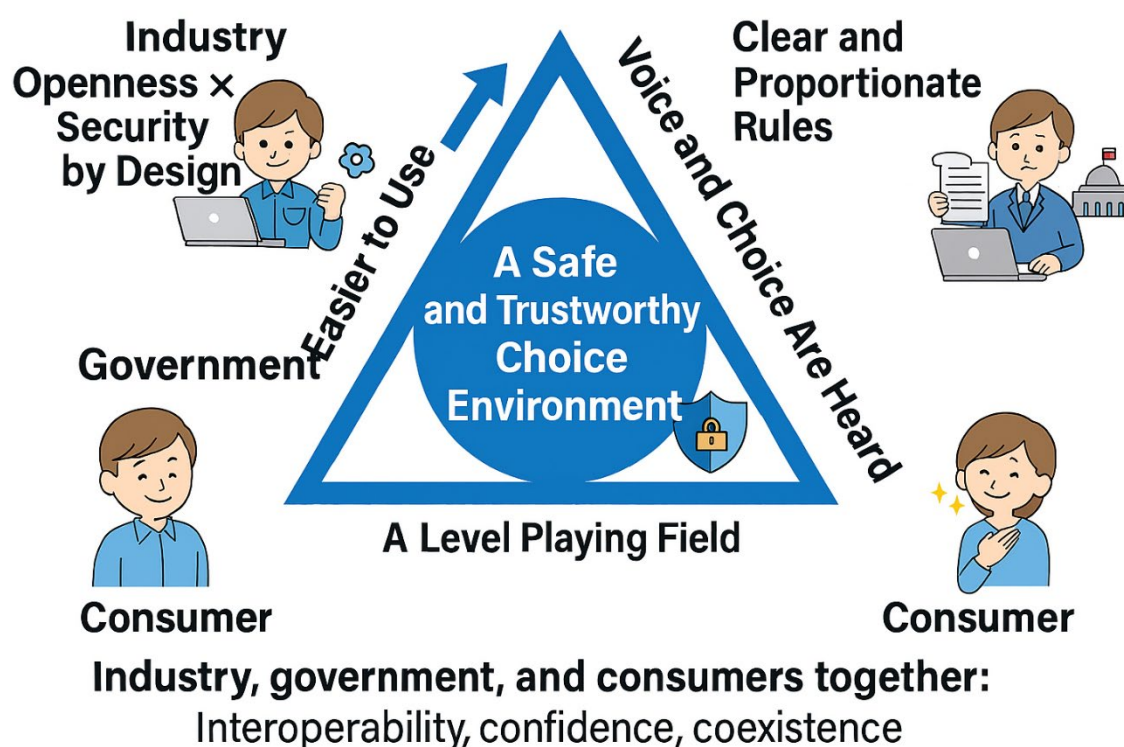


Figure 5.4 Collaboration to Realize a Safe and Trustworthy Choice Environment

Chapter 6. Conclusion

As demonstrated throughout this white paper, OS interoperability and data Portability are not merely technical specifications or compliance requirements associated with specific regulatory frameworks. They constitute foundational conditions that support consumer choice, fair competition, and sustained innovation in the digital market.

As digital services increasingly permeate all aspects of daily life and economic activity, limitations embedded in mobile ecosystems can have far-reaching effects. When OS interoperability and data portability across devices are insufficient, consumers face restricted choices and consequently no meaningful price competition, developers encounter structural barriers to entry, and the benefits of technological progress may become concentrated within specific platforms or ecosystems.

Security and privacy are indispensable elements of trust in digital services. However, as this paper has emphasized, they need not stand in opposition to openness or interoperability. When appropriately designed and governed, OS interoperability and data portability across devices can coexist with robust security and privacy protections, reinforcing rather than undermining consumer confidence.

The consumer survey results presented in this paper indicate that improvements in OS interoperability and data portability have the potential to alter consumer behavior, expand latent demand, and stimulate more dynamic competition. These effects are not automatic. Regulatory frameworks such as Japan's Mobile Software Competition Act (MSCA) provide an important institutional foundation, but their real-world impact

depends on effective implementation, informed participation by industry, and awareness among consumers.

Crucially, progress in this area cannot be achieved by any single actor. Governments, industry participants, developers, and consumers all have roles to play. OS interoperability and data portability only generate tangible value when they are implemented, tested, utilized, and continuously refined through practice and dialogue.

ODBC remains committed to advancing an open digital ecosystem centered on a Safe and Trustworthy Choice Environment. By providing empirical insights grounded in consumer experience and engaging constructively with policymakers and industry stakeholders, ODBC seeks to contribute to the translation of policy principles into practical outcomes.

It is ODBC's hope that this white paper will serve as a shared reference point for stakeholders seeking to move beyond abstract debates and toward coordinated action. Through sustained collaboration and evidence-based discussion, OS interoperability and data portability across devices can become enduring pillars of a more open, innovative, and trustworthy digital market.

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