MIS Quarterly Executive

Volume 20 | Issue 4 Article 6

December 2021

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Digital service platforms need to be embedded in external device platforms because they are not bundled with a proprietary device. From our analysis of the Spotify music streaming service, we have identified three strategic objectives that service platform providers need to pursue as they establish and scale their services. Achieving each objective will require trade-offs, and we described the tactics Spotify used to manage these trade-offs. We conclude by providing recommendations on how other service platform providers can apply these tactics.[1,2,3]

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Challenges and Opportunities in Establishing and Scaling Digital Service Platforms

Digital service platforms are software applications embedded in other digital platforms. Like all digital platforms, they profit from mediating digital resource transactions of various forms between producers and consumers, and their primary source of growth lies in attaining and maintaining positive network effects. Service platforms are distinct from other platforms in that their core value proposition is composed of intangible digital service elements and that they need to be embedded in device platforms before users can access them. In this article, we draw on our research on Spotify to demonstrate how digital service platforms' characteristics generate both challenges and opportunities as well as how platform providers should balance tactical trade-offs when pursuing strategic objectives. Our purpose is to provide actionable advice to current and prospective service platform providers—i.e., firms with apps that mediate digital resource transactions between groups of producers and consumers without having access to their own proprietary devices.

A prime example of a digital service platform is Spotify, the dominant digital music streaming service globally. Spotify is available in 92 countries and has 345 million active monthly users (over 155 million of whom are paying subscribers) and around 6,500 employees. The processes involved in Spotify reaching this position illuminate the conditions, challenges and opportunities encountered by digital service platforms associated with the mediation of digital resources in the constantly evolving digital platform landscape (Figure 1). In this

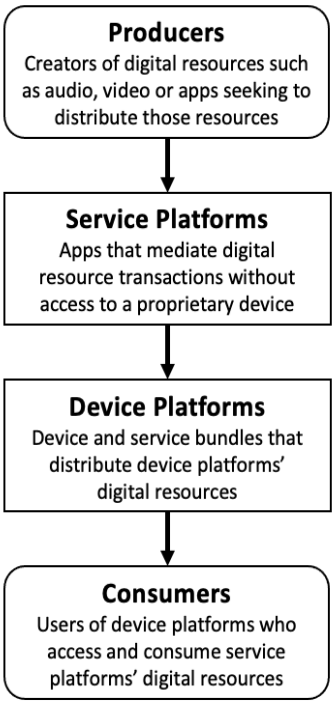
1 Varun Grover and Kalle Lyytinen are the accepting senior editors for this article.

2 The authors thank the editors and the review team for their constructive feedback and thoughtful guidance throughout the review process.

3 An earlier version of this article was presented at the Hawaii International Conference on System Sciences (HICSS) in 2018.

DOI: 10.17705/2msqe.00053

Figure 1: Mediation of Digital Resources in the Digital Platform Landscape



landscape, the core function of service platforms is to mediate the transfer of digital resources between those who produce them and those who consume them (in Spotify's case, the digital resource is primarily audio content from artists and rights holders, which is purchased by music consumers).

Like all digital service platforms, Spotify is purely software based and therefore inherently intangible.[4] It cannot be physically touched and interacted with directly; consumers access the service through third-party devices and the user interface of a digital device platform.[5] Digital device platforms are physical devices bundled with service elements that provide capabilities to distribute service platforms' digital resources to consumers. To mediate resource transactions, service platforms must therefore be embedded as apps or otherwise integrated into device platforms. For Spotify, device platforms include diverse products such as mobile phones (e.g., with iOS or Android operating systems), car infotainment systems (e.g., Volvo Sensus), TVs, wearables and smart speakers.

The competitive dynamics facing digital service platform providers are highly volatile and challenging to navigate. These dynamics partly originate from the characteristics of digital service platforms—a service-based value proposition, software-based architecture without proprietary devices, and inherent dependence on device platforms for resource mediation and value appropriation. Our analysis of Spotify shows that providers of digital service platforms must successfully address three overarching strategic objectives to establish and scale their platforms effectively: 1) generate positive network effects rapidly, 2) enable and facilitate scope expansion, and 3) strongly establish their platform position relative to device platforms.

4 For a thorough discussion of the distinction between material and nonmaterial digital objects, see Faulkner, P. and Runde, J. "Theorizing the Digital Object," *MIS Quarterly* (43:4), August 2019, pp. 1279-1302.

5 Our distinction between service and device platforms draws on the concept of a layered architecture for digital products and services described in Yoo, Y., Henfridsson, O. and Lyytinen, K. "Research Commentary—The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research," *Information Systems Research* (21:4), December 2010, pp. 724-735.

First, a digital service platform's value proposition is heavily based on mediated transactions rather than internal resources. Thus, it is essential to attract a critical mass of users and producers to quickly establish high levels of resource exchange through the platform and generate positive network effects (i.e., increase the platform's value through rapid growth of connected producers and consumers). For instance, increases in the number of drivers connected to the Uber ride-sharing platform enable passengers to find available rides more efficiently. Producer and consumer growth creates a positive feedback loop that increases platform value and attracts even more producers and consumers. Though generating positive network effects is a core strategic objective for most platforms, it is particularly relevant for service platforms, given their specific characteristics and unique position in the digital platform landscape.

Second, digital service platforms must enable and facilitate functional scope expansions to generate greater variety in their service offerings. Because service platforms are entirely composed of a software-based architecture, they can easily be imitated by others. In fact, anyone can purchase a fully operational clone of, for example, Tinder or Facebook and launch a competitive service within a couple of days. To protect themselves against imitations by competitors, digital service providers need to ensure that their platforms offer distinct, appealing and continuously innovative features and resources to make them harder to copy, and must increase their capacity for further innovation.[6] However, while undoubtedly both useful and necessary, increasing the variety of a service offering also adds complexity in terms of compatibility and consistency across the landscape of device platforms on which service platforms depend. Hence, digital service platform providers need appropriate tactics to successfully address the strategic objective of viable scope expansion.

Finally, because digital service platforms depend on device platforms to distribute their offerings, they need to strongly establish their platform position. To achieve this strategic objective, service platform providers must have good exposure to device platforms' user bases (e.g., by being promoted on device platform app stores) and ensure they have favorable terms for the distribution of their digital resources. Having a prominent presence is particularly vital with device platforms that have become dominant and function as core gatekeepers to a particular group of consumers as a result of technological and market consolidations. In such contexts, service platform providers must also be vigilant so they can detect and deter or counter "envelopment"[7] attacks by device platform providers seeking to leverage their gatekeeper position, user base and resources to create directly competing bundled offerings. In many respects, the balance of power between service and device platforms may be tipped in favor of the latter. Hence, effectively and purposely establishing their position relative to device platforms is a core strategic objective for digital service platform providers.

Below, we describe how Spotify successfully navigated the challenges and opportunities as it pursued these three strategic objectives. Given the rapid development of Spotify from a small start-up to the largest music streaming service globally, it is a good example of how to establish and scale a digital service platform. Spotify's pursuit of the strategic objectives involved managing the inherent trade-offs through balancing or alternating between several different tactics. Our insights obtained from analyzing the Spotify case are structured around the three strategic objectives and illustrate both the trade-offs made and tactics employed. (See the Appendix for details of our research method.)

How Spotify Established and Scaled its Digital Service Platform

Spotify is a Swedish digital audio streaming service provider that primarily offers music and podcasts from artists and rights holders to consumers. It was founded in 2006, officially launched its service in 2008 and has been the dominant digital audio streaming service globally since 2015. Spotify employs a "freemium" pricing

6 For an in-depth explanation of how technological configurations enable continuous innovation, see Zittrain, J. "The Generative Internet," *Harvard Law Review* (119:7), November 2005, pp. 1975-2040.

7 For a primer on platform envelopment, see Eisenmann, T. R., Parker, G. and Van Alstyne, M. "Platform Envelopment," *Strategic Management Journal* (32:12), July 2010, pp. 1270-1285.

Table 1: Spotify's Tactics for Balancing Trade-Offs Encountered in Pursuit of Strategic Objectives

Strategic Objective	Trade-Off Encountered	Tactics for Balancing the Trade-Off
1- Rapidly Generate Positive Network Effects	Rapid consumer growth is important, but may threaten the durability of the platform infrastructure and business model	*Diffusion*: Facilitating consumer uptake by making the platform accessible across device platforms and inexpensive to join
		Control: Monitoring, restraining and reducing costs of consumer growth
2- Enable and Facilitate Functional Scope Expansions	Attaining dynamic resource variety is important, but may threaten the platform's ability to become embedded in multiple device platforms	*Inbound interfacing*: Enabling dynamic functional variety inside the platform
		Outbound interfacing: Enabling dynamic functional variety outside the platform
3- Strongly Establish its Platform Position	Deep engagement with device platforms is important, but dependencies on them may generate unfavorable business conditions and challenging competition	*Partnering*: Engaging in deep collaborations with key players to combine resources for mutually beneficial purposes, and thus extending beyond conventional platform-provider and complementor relationships
		Liberating: Increasing service platform autonomy, competitiveness and bargaining power in relationships with device platforms

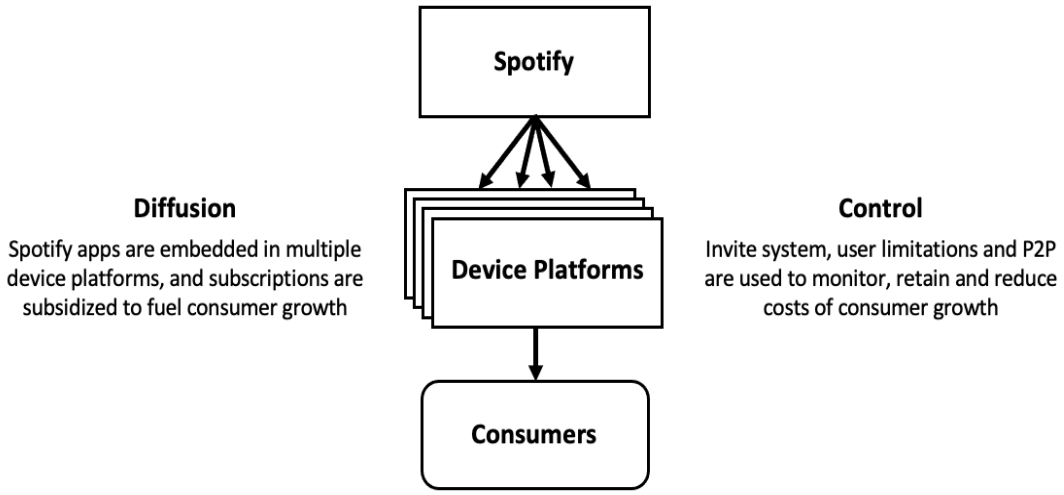
strategy with free and premium subscription options, and its service is currently available as apps across a wide range of different audio devices, or as an integrated function in the devices.

To reach its current dominant position, Spotify has had to deal with considerable challenges. Even though it has attracted around $2.6 billion in venture capital, Spotify is still struggling to make a profit. It has recurrently faced criticism from rights holders and artists for not compensating them fairly and has repeatedly struggled to negotiate music licensing deals. However, our analysis shows that due to its characteristics as a service platform, it has been particularly important for Spotify to address the challenges arising from its pursuit of the three key strategic objectives identified above. Achieving each objective required Spotify to manage a particular trade-off—i.e., to find a productive balance between the strategic objective and another important yet incompatible goal. The tactics used to balance the trade-offs encountered within each strategic objective are summarized in Table 1, and described in detail below.

Tactics Used to Balance Trade-Offs When Pursuing the Strategic Objective of Rapidly Generating Positive Network Effects

As with all new digital platforms, when Spotify started in 2006 it had to kick-start network effects by attracting a critical mass of consumers and producers. To attract consumers, it needed to meet the needs of music consumers, many of whom had for years been involved in extensive illegal downloading. Between 2000 and 2005, global music sales had dropped 23%, and estimates suggested that around 20 music tracks were downloaded illegally for each one sold. In terms of legal options for digital music consumption, online music stores, such as Apple iTunes, dominated the market, while digital music streaming services that provided access to music for a subscription fee accounted for only around 7% of total music sales revenues. Because of their recent experience with extensive piracy, music producers that Spotify sought to attract on the supply side had reason to be skeptical. However, by rapidly growing its consumer base, even if those consumers were not at first profitable, Spotify believed it could convince

Figure 2: Tactics Used by Spotify to Balance Rapid Growth and Durability



music producers of the platform's long-term potential. But to compete with both illegal and legal options for consumers, Spotify needed to match and perhaps even surpass them in price and user convenience.

Our analysis shows that Spotify deployed a diffusion tactic to enable rapid consumer growth by making its service inexpensive and widely available across several devices. However, as Spotify recognized that rapid consumer growth threatened the durability of its business model and infrastructure, it combined diffusion with a control tactic to monitor, restrain and reduce the costs of consumer growth (see Figure 2).

The Diffusion Tactic: Make the Service Inexpensive and Accessible. To facilitate consumer uptake, Spotify subsidized and continuously increased available pathways to access its platform. Since its official launch in October 2008, Spotify has used its freemium business model to subsidize consumers by allowing them to choose a free account rather than paying a subscription. The free account allows consumers to stream music with certain limitations, such as occasionally being interrupted by audio advertising. In combination with not needing to purchase a specific device to access Spotify, the free subscription has been an essential driver of adoption.

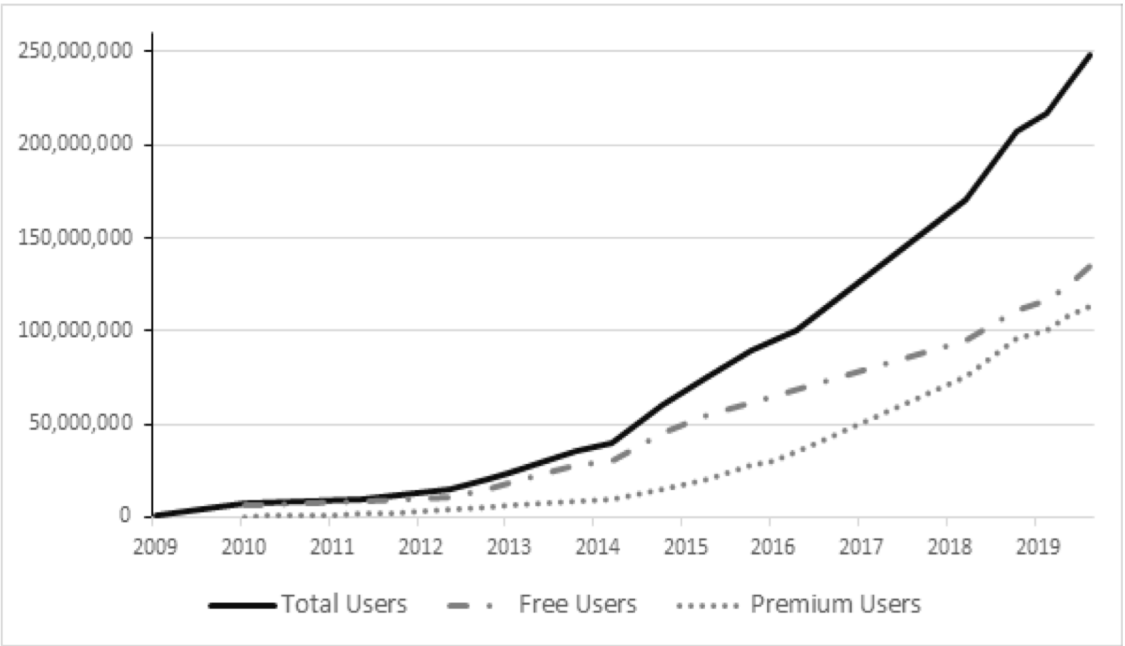
Spotify has also worked intensively to continuously embed its apps in third-party devices to increase the pathways through which consumers can access the platform. Initially, the service was made available through apps for desktop[8] computers running Windows and Mac OS operating systems. Later, in 2009, Spotify apps were embedded in the iOS and Android platforms to exploit the proliferation of mobile digital device platforms. Soon, apps followed for other mobile phone platforms such as Symbian, Windows Phone, Blackberry and webOS. As other devices have been enabled to support third-party services, Spotify has continued to expand beyond desktop and mobile devices to smart TVs, car infotainment systems, wearables, home assistants and smart speakers. In total, Spotify apps were made available on at least 30 different devices between 2008 and 2014. At the time of writing (2021), Spotify lists over 300 Spotify-compatible devices,[9] probably more than any other current digital service.

With the diffusion tactic, Spotify has achieved massive consumer growth (see Figure 3). By March 2009, about six months after its official launch, there were 1 million users (including around 320 000 premium subscribers). By July 2011, this had increased to 10 million (including 1.6 million premium subscribers), and by June 2016 the total number of users had increased

8 In this article, the term desktops also includes laptops.

9 For a current summary of Spotify availability, see https://spotify-everywhere.com/.

Figure 3: Spotify's Consumer Growth in Terms of Free, Premium and Total Numbers of Users



to over 100 million. In October 2020, Spotify reported having 320 million monthly active users (with 144 million premium subscribers).

The two elements of the diffusion tactic (low cost and accessibility) were both enabled by decoupling Spotify, as a service platform, from specific devices. Not only did making its service free to use lower the threshold for consumer adoption, but the lack of lock-in to specific devices also substantially decreased the cost of adopting the service. Spotify set out to become omnipresent so that consumers could access and use its service regardless of the devices they owned. However, the company recognized the need for a tactic to counter the dangers of growing too big too rapidly, as we now describe.

The Control Tactic: Countering the Negative Effects of Rapid Growth. While the massive consumer growth Spotify achieved through its diffusion tactic is impressive, closer inspection reveals that the company carefully monitored and intentionally restrained its growth to ensure the durability of its business model and infrastructure. Business durability is the extent to which the business model can support the costs associated with subsidizing consumer and producer uptake. Infrastructure durability is the capability of the underlying platform infrastructure to support a good service experience as the number of users scales up.

During the first years of its existence, Spotify monitored and controlled the maximum number of free users through an invite system, where the company issued a limited and gradually expanding number of invitations to register for a free account. This tactic enabled Spotify to control the maximum number of free users, and thus ensure that its business model and infrastructure could cope with the growth. During periods and markets when it was important to grow rapidly, Spotify could remove the invitation requirement, as it did just two months after launching in the U.S. At other times, the requirement could be reinstated in response to intensive user growth.

Two years after launching, Spotify shifted from controlling the number of free users to controlling the extent to which they could use the service. New types of subscriptions allowed consumers to join the platform without an invitation, but their use was limited in terms of time (e.g., 20 hours of listening per month) or

interactions (e.g., playing a particular track at most five times per month).

To further reduce costs associated with subsidized consumer growth, Spotify has leveraged free users' ability to provide nonmonetary resources of value to service platforms. Information on users and their interactions with platforms has always been an important source of value, but Spotify used a novel way of leveraging its free users during its early development. When the company launched, it integrated peer-to-peer (P2P) technology, which was highly important in enabling music piracy, into its first desktop apps. Rather than the company's servers storing and transferring data (and thus requiring massive capacities), as in more traditional client-server models, the P2P technology enabled any free user to distribute music to other users. Moreover, Spotify also launched an "Offline mode" feature that enabled consumers to conveniently download selected music to local storage. Ultimately, due to the use of these technical solutions, only around 9% of all music that free users streamed came from Spotify's servers, while the rest came from users' local cache storage and the P2P network.[10] Together, these solutions further reduced the strain on central servers and the cost of subsidizing free users, and at the same time improved the service experience.

In summary, the Spotify case shows that, while fast growth is vital for creating the network effects that service platforms depend on, growing too fast may harm business and infrastructural durability. The key for service platform owners is to identify tactics that productively balance the trade-off between growth and durability.

Tactics Used to Balance Trade-Offs When Pursuing the Strategic Objective of Facilitating Functional Scope Expansion

Spotify's software-based architecture implies that it is relatively easy to imitate, which means that to attain its current position, it has had to compete with digital service platforms with very similar value propositions. Digital service platforms in the music streaming market tend to employ a freemium business model with free ad-supported subscriptions and (similarly priced) premium subscriptions to choose from. Though negotiations between streaming services and music artists and rights holders for access to content can be protracted, all services eventually provide access to a similar selection of music content. Hence, to compete successfully, Spotify needed to find ways to diversify its service functionality. The *inbound interfacing* and *outbound interfacing* tactics that Spotify used to balance the trade-off between functional diversity and service dissemination are summarized in Figure 4 and described below.

Our analysis shows that Spotify alternately focused on using inbound interfacing and outbound interfacing tactics to balance the trade-off between functional variety and service dissemination. Inbound interfacing involved exploiting the flexibility offered by its digital architecture through an internal app store that enabled external developers to develop and distribute apps via Spotify's service. However, Spotify realized that the dynamic and potentially unbounded variety offered to service platforms by internal app stores may be incompatible with simultaneous presence on many device platforms, which may be a more desirable goal. Therefore, Spotify shifted toward applying an outbound interfacing tactic, focused on attaining a dynamic resource variety outside of its service.

The Inbound Interfacing Tactic: Letting Outside Resources In. The competition between Spotify and rival service platforms was particularly intense around 2010. One competitor (Deezer) expanded in 2009 from an ad-supported music streaming website (launched in 2007) to also providing apps for desktops and offering premium subscriptions. Around the same time, the music-themed social media site MOG (which later became Apple Music through a series of acquisitions) launched its own subscription-based music streaming service. In 2010, two other rival services were released—WiMP (which later became Tidal) and Rdio (launched by Skype's founders). Thus, Spotify found itself facing competition from several service platforms with very similar value propositions.

In December 2011, the company launched Spotify App Finder, an app store tied to an open

10 How Spotify combined P2P and client-server technologies, and the results, are extensively described in Kreitz, G. and Niemela, F. "Spotify: Large Scale, Low Latency, P2P Music-on-Demand Streaming," *Proceedings of 2010 IEEE Tenth International Conference on Peer-to-Peer Computing (P2P)*, September 2010.

application programming interface (API) that enabled third parties to develop and distribute apps within the core Spotify service. App Finder was populated with complementary apps over time and could be used by consumers using Spotify on a desktop platform to choose apps that provided new content and new functionalities for their music listening experience. We identified at least 80 unique apps that have been available at some time through App Finder. Most of these apps provided content curation features (e.g., apps that recommended Spotify content based on specific preferences) or complementary content (i.e., apps that imported other forms of content, such as lyrics, and combined it with Spotify's). There were also apps that enabled consumers to see concert dates and buy concert tickets, and social apps that enabled them to organize content into playlists collaboratively.

Given that app stores have become a key mechanism for value creation and capture in many digital device platforms, Spotify's decision to launch and host App Finder seems to have been a "no brainer." Moreover, it also generated value for Spotify's consumers in terms of extending the functional variety of the service. Therefore, Spotify's announcement that App Finder was being withdrawn after only about two years in service surprised many people, not least the developers who supplied apps for it. However, our analysis indicates that the rationale behind closing App Finder was based on its incompatibility with Spotify's objective of becoming available on as many device platforms as possible.

This conflict of objectives was not apparent when App Finder was launched. At that time, Spotify's consumers most frequently accessed its service through desktop platforms, which offered openness and flexibility that Spotify could leverage to implement its App Finder. However, around 2013 user preferences started to shift toward other, primarily mobile, device platforms. To enable and maintain its presence on these more strictly governed device platforms, Spotify needed to adapt to restrictions on what third-party developers could do, which often excluded embedding an app store within an app. Recognizing that the proliferation of device platforms, and mobile platform adoption in particular, would continue, Spotify adjusted its strategy in line with this platform landscape trend.

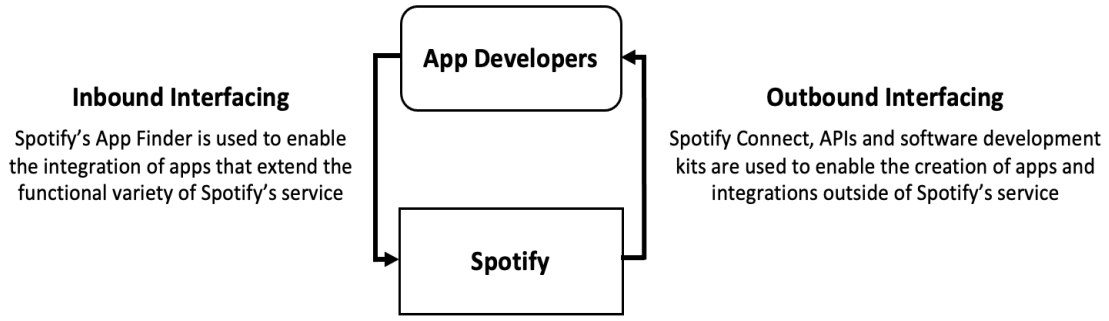
The Outbound Interfacing Tactic: Letting Internal Resources Out. To support the objective of rapidly disseminating its service across device platforms, Spotify has, over time, increasingly focused on leveraging open digital interfaces to export rather than import functional variety. Such outbound interfaces are designed to stimulate the generation of third-party apps and integrations that embed Spotify's resources, create new functions and extend Spotify's presence in external services and devices, while still delivering value to the Spotify platform. While early examples of outbound interfaces existed before and during the App Finder era, those launched subsequently have been more sophisticated and purposefully directed. The company has also more selectively and carefully controlled the complementary external resources brought in to extend its service functionality.

An interesting example of an outbound interface is Spotify Connect. Launched in September 2013, this interface is used by device manufacturers to integrate Spotify with the firmware of a device. Consumers can use these devices to listen to Spotify content by using a Spotify app on a desktop or mobile as a remote control. Spotify Connect has substantially increased the number of devices that can be used to access Spotify, and it has been particularly successful in integrating Spotify in devices such as smart speakers, car infotainment systems and TVs.

In addition to providing the Connect interface, which is aimed exclusively at device manufacturers, Spotify also supplies APIs and software development kits (SDKs) to help third-party app developers create apps with embedded Spotify functionality. In response to the growing importance of mobile platforms, in 2014 Spotify released two SDKs specifically directed toward the development of embedded Spotify apps for iOS and Android smartphones. Soon after that, Spotify also launched its Web API to facilitate the development of third-party Spotify apps for the web.

These outbound interfaces enable the generation of functional variety outside rather than inside Spotify's service (as inbound interfaces do). Developers use outbound

Figure 4: Tactics Used by Spotify to Balance Functional Diversity and Service Dissemination



interfaces to combine Spotify functions and content with their own to create new functionality in external services or devices. To ensure value appropriation, Spotify imposed specific rules and restrictions on the use of its outbound interfaces. For example, while the Web API was freely available, apps using it could only offer streaming of 30-second previews of audio tracks. To listen to whole tracks, users needed to be redirected to Spotify's apps. And the rules for using the iOS and Android SDKs stipulated that apps could not require payment for streamed full-length music tracks unless the user had a premium Spotify account. These two measures had similar results. They either sent users to Spotify's proprietary apps or required premium accounts that ensured that Spotify would receive income and personalized use data when apps created with outbound interfaces were used.

The increasing focus on outbound interfaces has made Spotify more selective in integrating functionality and content from external players into its core service. Examples include how Spotify chose to integrate functionalities from some of the most popular apps in the App Finder before it was closed. This was achieved either through acquisitions (as when Spotify acquired the app developer Tunigo and integrated its content curation functionality) or more collaborative integrations (as when Spotify drew on the Songkick app to offer concert listings). In contrast to apps in the App Finder, these moves enabled access to functionality through platforms other than desktops.

Overall, the way Spotify has worked to diversify its resources highlights the trade-off that digital service platform providers need to make between striving to attain functional variety and wide dissemination across external platforms. To manage this trade-off, service platform providers must decide when it is strategically better to locate dynamic functional variety internally or externally.

Tactics Used to Balance Trade-Offs When Pursuing the Strategic Objective of Strongly Establishing the Platform Position

The relationship between service platforms and the device platforms hosting them can be double-edged. On the one hand, Spotify and device platforms often have mutually beneficial relationships. Spotify provides content and functionalities that add substantial value to devices, while the devices provide the hardware and operating systems that enable Spotify to run its applications and gain essential market access. As well as providing access, a device platform provider may also give certain service platforms other advantages. Examples include favorable exposure of their apps in the provider's app stores (e.g., inclusion in the listing of recommended apps), pre-installation of their apps on the provider's devices (e.g., Google Chrome is the default web browser on the OnePlus phone) and being the default content player for a virtual assistant (e.g., Amazon Music is the default music service for Amazon's Alexa).

On the other hand, Spotify's inherent dependence on device platforms for service distribution to consumers has inevitably been accompanied by unfavorable conditions and led to tough competition from bundled service and device offerings. By and large, device platform providers dictate the business terms and conditions under which service platforms must operate because they set the rules that control the apps and functionalities and specify how apps in their app stores can be monetized. Device platform providers have particularly strong power to bias conditions in their favor when they are one of a few dominant platforms in a particular market.[11] Several device platform providers have sought to leverage their power to launch envelopment attacks on Spotify by providing their own music service as part of a bundled offering.

Thus, service platforms may have much to gain from deep engagement and intertwining with device platforms. At the same time, however, dependence on device platforms may reduce service platforms' ability to compete with favorable conditions, particularly when device platform providers decide to become competitors. The two tactics—*partnering* and *liberating*—that Spotify used to balance the trade-off between deep engagement with device platform providers and overdependence on them are summarized in Figure 5 and described below.

The Partnering Tactic: Engaging Deeply with Key Device Platforms. The partnering tactic involves formal collaborations with key players in the digital platform landscape to combine resources for mutually beneficial results. In contrast to the diffusion tactic, which primarily serves to distribute apps across devices, the partnering tactic establishes deeper collaborations with device platforms and other key players to extend benefits beyond those that can be gained through ordinary relationships between platform providers and app complementors.

The most interesting examples of partnering at Spotify are their partnerships with device platforms that were previously direct competitors. In 2012, Microsoft launched a digital music streaming service called Xbox Music.[12] As the name suggests, Xbox Music was initially installed on Microsoft's gaming consoles, but its use was eventually extended to other Microsoft devices and operating systems, as well as Android and iOS systems. It was marketed as a service for consumers who wanted to stream and own (i.e., purchase and download) music, with good integration across different devices. Integration was achieved by the Microsoft OneDrive cloud service, synchronizing users' music content across their gaming consoles, computers and mobile phones.

By 2017, however, the nature of the relationship between Microsoft and Spotify had changed. For some time, the two companies had collaborated and were now jointly releasing and marketing Spotify apps for the Windows Store and Xbox One gaming console. Toward the end of 2017, Microsoft announced that it would discontinue its music streaming service, and, rather than abandon the users of the service, Microsoft facilitated their move to Spotify, including migrating their music libraries and playlists to Spotify.

Like Microsoft, Samsung had also bundled a music streaming service with some of its smartphones but discontinued the service in 2014. In that same year, Spotify and Samsung collaborated to make the latter's smart speakers compatible with Spotify Connect. The two companies extended their collaboration in 2018 when they announced a more formal partnership that included deeper integration of the Spotify service into Samsung's devices, effectively making Spotify Samsung's default music player.

In addition to partnering with device platform providers, Spotify has also partnered with other service platform providers, the most prominent being Facebook. In April 2010, Spotify added the ability for its users to retrieve data from their Facebook accounts, including demographic and social network data, to extend their Spotify user profiles and establish social networks within Spotify. During the following year, the collaboration evolved into a more formal partnership, as Facebook made it possible for Spotify users to post their listening activity on Facebook in real-time and start playing content

11 For example, the Coalition for App Fairness (https://appfairness.org/) sees the conditions imposed by the Apple App Store on app developers as unfair competition.

12 Xbox Music was based on the earlier Microsoft Zune Music Marketplace and was later renamed Groove.

in the Spotify app running on the side. As part of this deeper integration, Spotify initially made it mandatory for all new customers to sign in with their Facebook account when signing up for a Spotify subscription.

Over time, the partnership with Facebook has resulted in more exposure for Spotify as it became increasingly integrated with Facebook's different services and features. For example, Spotify was integrated into Facebook Messenger in 2017 to enable music to be shared during chats. In 2018 and 2019, it was integrated with Instagram Stories and Facebook Stories to enable the sharing of music in posts, and Facebook has recently announced a Spotify mini-player that enables full-length audio tracks to be played within Facebook.

Since its early days, Spotify has also worked closely with various internet service providers (ISPs) to create combined value bundles. This type of collaboration has been particularly useful when Spotify was entering a new geographical market and sought to rapidly grow its user base. ISP partners have included Telia in Sweden and Finland, Three UK in the United Kingdom and Deutsche Telekom in Germany. In each case, the benefits have been similar: the ISP provides free or discounted Spotify premium subscriptions to its current or prospective customers while Spotify gains exposure to the ISP's often vast customer base. Though the partnering tactic—whether with device platforms or ISPs—has undoubtedly promoted the development of Spotify, the company has also encountered device platform players and relationships that needed to be handled in more aggressive ways. Hence, the need for the liberating tactic.

The Liberating Tactic: Gaining Autonomy in Relationships with Device Platforms. The downside of having close relationships with device platform providers is that Spotify may become dependent on the platform, which can impose unfavorable business conditions. Moreover, the platform provider may mount an envelopment attack on Spotify. To manage these challenges, Spotify has employed the liberating tactic to increase its autonomy, bargaining power and competitiveness in its relationships with device platforms.

A good example of the challenges stemming from Spotify's dependence on device platforms is its relationship with Apple. From about 2019 onward, this relationship has degenerated into open conflict about unfair competition in the digital platform landscape, specifically relating to the terms and conditions imposed on Apple App Store developers. The roots of the conflict lie in Apple's release of its music streaming service, Apple Music, in 2015. Apple charges a 30% commission on all subscriptions, meaning that those subscribing to Spotify via the Apple App Store had to pay 30% more than they would by subscribing directly with Spotify. As a result, Apple could both offer Apple Music for a lower price than competing services and profit from each sale made through the Apple App Store. Spotify saw this as unfair competition and urged its users to subscribe through a website rather than the Apple App Store.

In 2019, the conflict escalated as Spotify lodged a claim that Apple had violated the European Union's antitrust law,[13] stating that the Apple App Store rules gave Apple Music unfair advantages. As well as imposing a pricing model that service platforms may find unfair, Apple also restricts developers in terms of what apps can be accessed through its App Store, the user data they can retrieve and what they can do with the retrieved data.[14]

Our analysis shows that the liberating tactic has strengthened Spotify's autonomy, bargaining power and competitiveness in its relationships with device platforms such as Apple. This tactic involves taking actions that enable Spotify to circumvent the role of device platforms as consumer-access gatekeepers, to increase the unique value that device platform consumers can gain from Spotify and to build alliances with peers to gain leverage against what is perceived as unfair device platform competition.

The Spotify Connect interface provides a good example of circumvention. As previously described, this interface has undoubtedly been important for diffusing the Spotify service

13 For more information about the antitrust investigation of Apple, see *Antitrust: Commission opens investigations into Apple's App Store rules*, European Commission, June 16, 2020, available at https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1073.

14 For more information on the restrictions that Apple imposes on app developers regarding data retrieval and use from the iOS platform, see Eaton, B., Elauf-Calderwood, S., Sørensen, C. and Yoo, Y. "Distributed Tuning of Boundary Resources: The Case of Apple's iOS Service System," *MIS Quarterly* (39:1), January 2014, pp. 217-243.

across many device platforms, thereby helping to decrease Spotify's dependency on specific device platform providers. However, closer examination of how Spotify Connect works shows that it can also provide Spotify with the means to circumvent the restrictions imposed by device platforms such as Apple. Spotify Connect runs on devices that have Internet connectivity, implying that when using a device (e.g., an iPhone) as a remote control to play music on another device (e.g., a smart speaker), data can be transferred to Spotify without having to pass through the first device. This suggests that, even though a Spotify app may be running on a particular device platform, the Connect interface can enable data transfers that do not pass through it, thus enabling Spotify to circumvent device platform data restrictions.

Another way that the liberating tactic has strengthened Spotify's autonomy and competitiveness is through the actions Spotify has taken to ensure that it provides unique and significant value to device platform consumers. As previously discussed, service platforms may have difficulties providing unique value unless they connect to external resources, but our analysis also shows that expanding into content production can be a viable option for creating services that cannot be imitated. For instance, in 2016, Spotify began producing and distributing exclusive video content, such as music videos, an animated series on music history, a documentary on the early days of Metallica and an Archie motion comic. Although video content can still be found on Spotify today, it is severely limited compared to the available audio content. Moreover, video is not actively promoted as part of the core value proposition and, overall, the video venture has been largely unsuccessful.

Spotify has also launched initiatives, on a limited scale, to produce exclusive music content. While it has recorded and distributed live concerts since about 2012, in 2016, Spotify started to invite selected artists to record a limited number of songs and then promoted them as exclusive content on its streaming service. In 2018, the company took a further tentative step into traditional music industry territory when it enabled independent (indie) artists to upload their music directly to Spotify, effectively cutting out the role of record labels as middlemen in music distribution. This upload function was, however, relatively short-lived, as Spotify terminated it within a year.

Another, and more successful, liberating action taken by Spotify was its drive to become a prominent owner and producer of podcasts. The company started to add podcast content from external producers to its service in 2015 and launched its own first three podcast series in 2017. Spotify's podcasting efforts significantly intensified in 2019, when it bought podcast companies Gimlet, Anchor and Parcast and acquired extensive amounts of existing and prospective content. To further stimulate the production of exclusive content, Spotify has recently gone to some lengths to assist external producers in recording, uploading and managing podcasts. Through these efforts, Spotify is currently one of the two most frequently used digital services for podcast streaming.

In addition to actions intended to circumvent device platforms as data exchange gatekeepers and to ensure that the company provides unique value, Spotify's liberating tactic has included actions taken to form alliances with its peers. Specifically, Spotify is the driving force behind the creation of the Coalition for App Fairness.[15] Together with 11 other app developers, including music streaming competitor Deezer, dating platform owner Match Group and game developer Epic Games, Spotify formed the coalition in 2020 as an independent nonprofit organization. The coalition seeks to change what members perceive to be monopolistic control and unfair competition exercised by device platforms. At the time of writing (2021), membership of the coalition had grown to at least 56 app developer companies. However, it is too early to tell how much (if at all) the coalition will influence the likes of Apple and Google.

Our analysis of Spotify's pursuit of the strategic objective of establishing its platform position in relation to device platforms shows that digital service platforms need to manage the trade-off between the potential benefits of deep engagement with device platforms and the possible drawbacks resulting from overdependence. They need to balance actions that intensify and deepen their device platform

15 For information about the Coalition for App Fairness, see https://appfairness.org/.

relationships against actions that increase their autonomy, bargaining power and competitiveness in their relationships with device platforms.

Recommendations for Digital Service Platform Providers

Our analysis of Spotify has identified three strategic objectives that digital service platforms need to pursue when establishing and scaling their services. We have also highlighted the trade-offs with which each objective is associated. While attaining the network effects necessary for success requires rapid consumer growth, digital service providers must also ensure that the speed and extent of growth do not exceed the capacities of their business models and infrastructures. Dynamic and diverse functionalities may increase a platform's value and strengthen its competitiveness but may also constrain efforts to disseminate the service across device platforms. Similarly, deep relationships with device platforms can provide important benefits, but the resulting dependencies can also generate unfavorable conditions and tough competition.

The tactics applied by Spotify to balance these trade-offs can be used by other digital service platforms, but to apply them optimally, providers need to carefully consider the specific conditions of their service platforms and the digital landscapes in which they are embedded. The following five recommendations will help digital service platform providers to successfully adopt the tactics used by Spotify.

1. Understand and Leverage Your Consumers' "Homing" Behaviors

A key element of Spotify's diffusion strategy was exploiting the fact that users did not need to purchase a proprietary device to access the service. Spotify apps were made available across several device platforms—known as "multihoming" in platform strategy parlance. While most service platforms have more than one home (e.g., available on both iOS and Android platforms), Spotify has gone further than most in terms of the number of device platforms on which it is available. Key reasons why extensive dissemination has been important for Spotify include the nature of the specific digital resource transactions it mediates and how the platform landscape has evolved. Many consumers want to take digital audio content with them wherever they go, and during the last decade, diverse digital devices have emerged that enable this. Spotify has understood that these devices provide potential "homes" where service platforms and consumers can meet. To use Spotify's diffusion tactic, a digital service provider needs to know what devices its consumers use and wish to use for its specific resource transactions.

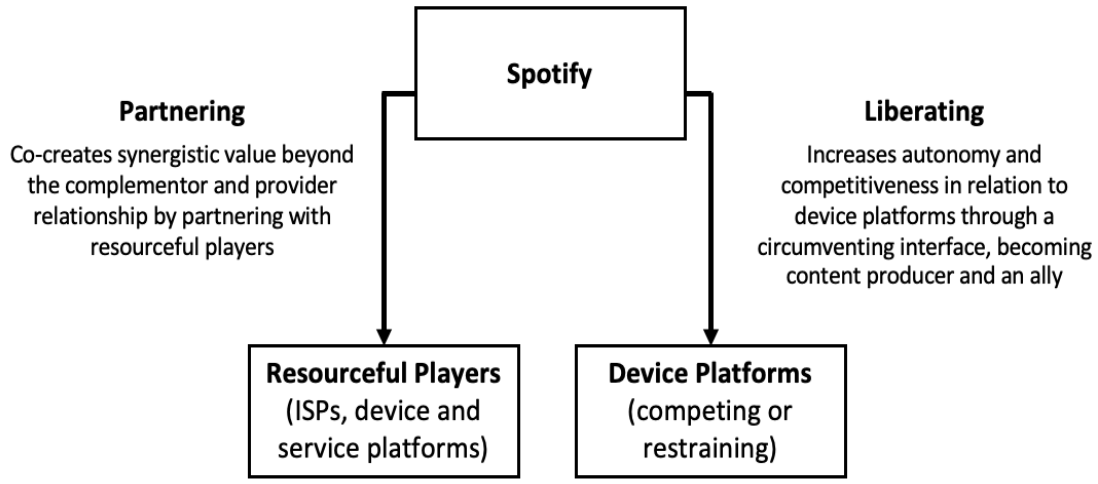
2. Identify the Factors that May Limit Rapid Growth

Digital service platforms' ability to scale rapidly in terms of consumer and producer growth is well known; the likes of Uber, TikTok and Clubhouse very quickly amassed huge numbers of users soon after their public launches. However, as Spotify found, the speed and extent of consumer growth are always limited by the capacity of a provider's technical and financial resources to support it, particularly when growth is fueled by subsidization. Extensive subsidization has become a common approach for digital service platforms to rapidly scale up their producers and consumers, but this requires financial resources that some platform providers lack. Though many start-up platforms, including Spotify, have received massive amounts of venture capital, they still struggle to make a profit after years in existence. Often, they are spending more on subsidizing consumer growth than they are earning.

Digital service providers therefore need to understand the factors that may limit both the speed and extent of their platforms' growth. To avoid exceeding these limits, providers need mechanisms for monitoring, limiting and (if necessary) stifling growth, and can apply elements of Spotify's control tactic for these purposes. For example, the invite system Spotify used to set upper limits for numbers of free subscribers at specific times, and the restrictions used later to limit their use of the service, could be flexibly applied by service platform providers to hasten or slow down subsidized consumer growth, as appropriate.

3. Deploy Inbound and Outbound Interfaces According to Your "Homing"

Figure 5: Tactics Used by Spotify to Balance Deep Engagement and Overdependence



Preferences and the Competition You Face

As illustrated by Spotify's use of its inbound interfacing tactic, the offerings available in app stores can provide the functional variety that service platforms may need to compete with their peers. However, this tactic became less useful once Spotify decided that desktops would no longer be the main device platforms for its service and shifted its focus to making the service available across the wide range of emerging digital media devices. As a consequence, Spotify switched to the outbound interfacing tactic, which supported dissemination across external device platforms and the delivery of a more consistent service experience on them.

Thus, while an inbound interfacing tactic may be fruitful for service platforms existing on a limited number of open and permissive device platforms, it may be less viable once providers seek to make their service platforms widely available. Regardless of whether internal functional variety or availability on a wide range of tightly governed device platforms is of higher strategic priority, the outbound interfacing tactic has less apparent drawbacks for service platform providers. Outbound interfaces can promote functional variety outside the platform, and service platform providers can capture value from them through mechanisms similar to those used by Spotify. Moreover, because device platforms tend only to offer inbound interfaces, the outbound interfacing tactic may provide particular advantages to service platform providers facing competition from device platforms.

4. Identify Potential Partners Beyond the Complementor and Provider Relationship

Digital service platforms can embed apps and integrations across a wide range of digital devices and services to gain access to new functionalities and consumer groups. However, as illustrated by Spotify's partnering tactic, providers may gain more from establishing partnerships that go beyond the traditional arms-length relationship between complementor and provider. Through bundling its value proposition with those of certain device platforms and ISPs, Spotify has been able to pool its own resources with the resources of powerful players in the digital platform landscape. Moreover, as Spotify's collaboration with Facebook indicates, deeper and long-lasting collaboration can enable partners to gain a better understanding of each other's business and technological architectures and to create relational value

from deeper integration of their joint resources. The key to establishing such partnerships lies in the synergetic potential of combining the resources of a service platform provider with those of the other players. To identify potential partners, providers should therefore not only look for potential partners with resources that can complement their own, but also consider whether a partnership would be more suited to realize short-term goals (such as marketing when entering a new market) or long-term goals (such as deeply cross-integrating resources to improve or create new services).

5. Take Actions to Weaken Dependence on Device Platforms

Device platform providers can strongly influence service platforms' exposure in their app stores and impose rules that determine how resources can be exchanged through them. If these conditions are unfavorable, they can severely limit a service platform's ability to create and capture value. Service platforms' inherent dependence on device platforms also increases the threat of envelopment attacks, where a device platform provider decides to launch its own version of a service. Device platform providers have access to data on how services are used on their devices, which enables them to identify the type of content and functionalities their consumers prefer and to make informed decisions on whether, when and how to launch their own rival services.

To avoid constraints on their ability to create and capture value, and to mitigate the risk of envelopment attacks, service platform providers must be aware of their inherent dependence on device platforms and, if necessary, take steps to increase their autonomy and bargaining power. To identify potentially harmful dependencies, service platform providers should assess the number and nature of device platforms they can use to reach existing or prospective consumers. If the number of platforms is very low, a service platform provider will be highly dependent on them. Harmful dependencies may occur if device platform providers use their gatekeeper position to create favorable conditions for themselves at the expense of the services they host.

Spotify's liberating tactic provides two types of actions that service platform providers can take to increase their autonomy and bargaining power, relative to device platforms. The first is to form alliances with other platforms facing the same challenges, with the aim of gaining leverage and bargaining power to pressure device platforms into altering the conditions they impose on them. The second is to circumvent device platforms' gatekeeping role, as Spotify did with its Connect interface. Ultimately, however, we believe the best way to gain leverage over device platforms is for service platforms to become gatekeepers to unique resources themselves. A good example is Spotify's diversification into podcasts. Its substantial investments in becoming a podcast producer and owner mean that it now provides unique content exclusively through its service.

Concluding Comments

In this article, we have presented the Spotify case to demonstrate how service platform providers can navigate complex and shifting relationships with device platforms. Because digital service platforms are decoupled from a proprietary device, they depend on external device platforms to provide them with access to consumers, which makes it challenging to create and sustain synergetic relationships with hardware resources to fuel network effects. Furthermore, the threshold to imitating their software-based architectures is low.

Our analysis of Spotify shows how digital service platform providers can overcome these constraints by leveraging their software-based architectures composition and unique position in the digital platform landscape. Though the lack of a proprietary device may make it impossible to achieve synergetic relationships with their own hardware resources, it also removes the need for service platforms to keep consumers locked into a specific device. Instead, they can leverage the continuing proliferation of devices capable of hosting external digital services. Additionally, even though digital service platforms can be easily imitated, the flexibility of their architectures and potential for interconnectivity enable them to achieve variety and uniqueness through an inbound and outbound exchange of resources with external players. Similarly, although service platform providers depend on device platforms to distribute and capture value, they have no inherent need to maintain

themselves within a proprietary value bundle and can instead seek to embed themselves in several device platforms.

Spotify's journey illustrates that successfully establishing and scaling a digital service platform does not happen in isolation. Instead, success depends on the extent to which service providers can establish and leverage relationships with other players in the digital platform landscape. While there are many examples of platform providers leveraging external developers to create complements, the Spotify case shows that consumers also have a role to play and are not necessarily merely sources of revenue. Consumers can also be used to distribute resources to a wider user group and thus drive positive network effects.

Appendix: Research Method

This article is based on a longitudinal case study of Spotify's evolution between 2006 and 2020. Our data sources included more than 2,500 posts from Spotify's own news outlets and external technology blogs (e.g., Techcrunch and Engadget) that have reported extensively on Spotify over the years. We also analyzed the annual reports of the six companies in the Spotify Group and made targeted inquiries through the Wayback Machine[16] to identify key changes in Spotify's website and pinpoint their time of occurrence. We supplemented this data with information in reports from the International Federation of the Phonographic Industry (IFPI) to gain a better understanding of the wider music streaming context, and from specific academic publications to gain a deeper understanding of Spotify's technological infrastructure.

We analyzed the data using process analysis methods. This involved using Aeon Timeline software to structure the data in an event sequence database and categorizing events based on their connections to key platform strategy dimensions—platform architecture, governance and the wider ecosystem. By analyzing in detail the actions Spotify took to change the architecture or rules associated with platform use and how these actions were influenced by (or influenced) events in the ecosystem, we identified sequences of events, which we interpreted as the tactics and trade-offs presented in this article.

16 Launched to the public in 2001, the Wayback Machine is a digital archive of the World Wide Web that allows users to see how websites looked in the past.

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