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TikTok's tools: The politics of platform tools for cultural production

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ABSTRACT

The rapid economic and infrastructural expansion of shortform video app TikTok can be attributed to its emphasis on software resources facilitating cultural production. Such tools contribute to the process of 'platformization,' the extension of platform business models and governance regimes within and outside the cultural sector, and 'infrastructuralization,' the increasing involvement of platform companies in providing critical systems and services. Platform scholars have argued that platformization and infrastructuralization lead to platform dependence. Increasingly, platform tools, being infrastructurally integrated with platform companies, drive these processes. Using the boundary resources framework, this article conducts a platform historiography of TikTok by mapping the expansion and evolution of its toolsets. In doing so, this paper makes two contributions to platform scholarship. The first is both conceptual and methodological: we classify platform tools and outline an interdisciplinary approach to systematically plot changes to them, remaining attentive to their dynamic, relational, and contextual nature. Second, our empirical work uncovers how first-party platform tools are developed and managed to become increasingly comprehensive, centralized, and integrated. The paper concludes with a call for future research on platform tool governance to understand how platform companies encourage platform dependence across societal sectors.

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Introduction

In May of 2024, TikTok Ltd. announced TikTok Studioa digital productivity suite for creators to make content for its popular shortform video app TikTok. The company celebrated the new app as a 'comprehensive creation and management platform' composed of 'free, easy-to-use creation tools [for creators] to polish their content with professional finesse' (TikTok 2024). In promotional material like this, TikTok Ltd. has repeatedly alluded to its larger tool-centric strategy: producing an increasing number of increasingly sophisticated and interlinked software resources for cultural production. In this paper, we study the evolution of such tools, specifically those meant to support cultural production on the TikTok app. By surveying how the means of production, distribution, promotion, and monetization of shortform video content change over

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time, we come to understand how platform companies govern their software resources to accumulate market and infrastructural power, thereby increasing the degree to which creators and cultural production become 'platform-dependent' (Poell, Nieborg, and Duffy 2021).

Let us start by delineating 'platform tools' from 'software tools' to be more precise when defining and qualifying the apps and other software resources provided by TikTok Ltd. to creators. Our definition of 'platform tools' builds on Foxman's (2019, 1) description of game engines as 'platform tools' or 'productivity software' responsible for 'enabling' and 'locking-in' game production. Compared to Foxman, we define 'platform tools' more broadly, as 'the combined set of software-based resources that are infrastructurally integrated with platform companies' (Mahetaji and David 2024, 23–24). Examples of such tools extend past the less visible infrastructural integrations associated with software development, such as application programming interfaces (APIs) and software development kits (SDKs), or what the typical end-user sees on their screen. Instead, our definition of platform tools is more inclusive, capturing in-app video cameras, video editors, automation tools powered by artificial intelligence (AI), and dashboards with data analytics—i.e. tools that are used by groups besides software developers and end-users (see Figure 1 for examples). By adopting this wider lens, we create space for platform scholars to interrogate deep-seated assumptions about who uses platform tools, how, and why.

Figure 1. Examples of platform tools for cultural production on the TikTok app.

Before starting our empirical investigation, we first consider the nebulous nature of 'TikTok' as an object of study. Consider what we mean when we say 'TikTok.' 'TikTok' can refer to the platform company (i.e. TikTok Ltd.), a subsidiary of its China-based parent company ByteDance Ltd.; or to an ecosystem of web and mobile applications; or simply the shortform video app. We respond to this ambiguity by calling for greater analytical specificity in TikTok studies and by attempting to provide a more exact circumscription of the corporate and infrastructural boundaries of TikTok. To do so, in the first half of this paper we start by locating TikTok Ltd. as a platform company within a large corporate structure. After that, we proceed to situate TikTok within its infrastructural setting. This involves introducing the notion of 'platform instances' (Nieborg and Helmond 2019), a term that describes the distinct versions of platform products and services that are designed with different features, functions, and user experiences in mind. Then, in our analysis, we apply these two perspectives: (1) TikTok Ltd. as a corporate entity and (2) TikTok as an 'assemblage of platform instances.' This allows us to better identify overlooked kinds of platform tools. To be able to engage in a more granular and systematic study of the resulting inventory of platform tools, we borrow the 'boundary resources' framework, put forward by information systems scholars Ghazawneh and Henfridsson (2013). This framework is useful to us because it accounts for platform tools as dynamic, relational, and contextual. That is, they are affected by constant temporal changes to corporate strategies and platform infrastructures (dynamic); by interactions among platform companies, creators, and other platform user groups (relational); and by legal and economic events within and outside platform ecosystems (contextual).

To structure our analysis, we deploy a 'platform historiography' (Helmond and van der Vlist 2019), which involves consulting current and archived platform documentation, technology-focused media articles, and developer repositories from the period of August 2018, when the TikTok app merged with lip-sync app Musical.ly, to June 2024. The results are then used to explore and underline the differences in the governance of first-party platform tools (those sanctioned by TikTok Ltd.) and third-party platform tools (those unsanctioned by TikTok Ltd.). We demonstrate that over the course of the app's lifespan, first-party platform tools have evolved to become highly comprehensive, centralized, and integrated, whereas third-party platform tools have either occupied marginal roles in cultural production or have been limited in their infrastructural connections with the TikTok app. Ultimately, platform tools shape the politics of platform labour and the cultural production process, which, in turn, affects the accumulation of platform power and cultural creativity and diversity (Poell, Nieborg, and Duffy 2021). The focus on platform tools becomes increasingly urgent with the integration of generative AI technologies in platform tools.

Locating TikTok

In everyday conversation and in the platform studies literature, 'TikTok' typically refers to the mobile application for shortform video production. The fact that the app rather than the company immediately comes to mind is of no surprise considering how it has steadily outranked competing apps from incumbents such as Meta, Snap, and X (Koetsier 2023), despite being positioned as a security concern and subject to government bans across regions. Barring a handful of cases (e.g. van der Vlist et al. 2024), platform scholars tend to

confine their analyses to the TikTok app, namely what they see on the screen of the app, such as the algorithm powering the main video feed, the 'For You' page (Duffy and Meisner 2023). Undoubtedly, the app is key to understanding the platform economy. But limiting research to the app alone masks the many other components of 'TikTok,' notably TikTok's economic aims as a platform company, as well as TikTok's position as infrastructure, or, as we will argue below, as an assemblage of platform tools associated with specific 'platform instances' (Nieborg and Helmond 2019). By taking this dual perspective, we surface platform tools that are often missed or obfuscated by the company.

TikTok Ltd. as a platform company

Platform tools accessed directly through the TikTok app are managed by the platform company TikTok Ltd., a subsidiary of ByteDance Ltd. Both TikTok Ltd. and ByteDance Ltd. operate as 'megacorporations,' meaning they have oligopolistic grips on their markets that they maintain by governing key 'media technologies' (Steinberg, Mukherjee, and Punathambekar 2022)—or as we call them 'platform tools.' TikTok Ltd. supplies platform tools such as a camera and video editor that creators can directly access from within the TikTok app. These platform tools are accessed through the end-user interface and form only one subset of the many available tools to create audiovisual content for the app. To locate other tools for cultural production on the TikTok app, we situate TikTok Ltd. within a highly interconnected corporate structure composed of various subsidiaries based in domestic and international markets (see Figure 2). Platform scholarship that considers TikTok outside its app boundaries, within a larger ecosystem, mostly narrows its attention on the TikTok app's domestic counterpart Douyin, aimed at the heavily regulated Chinese

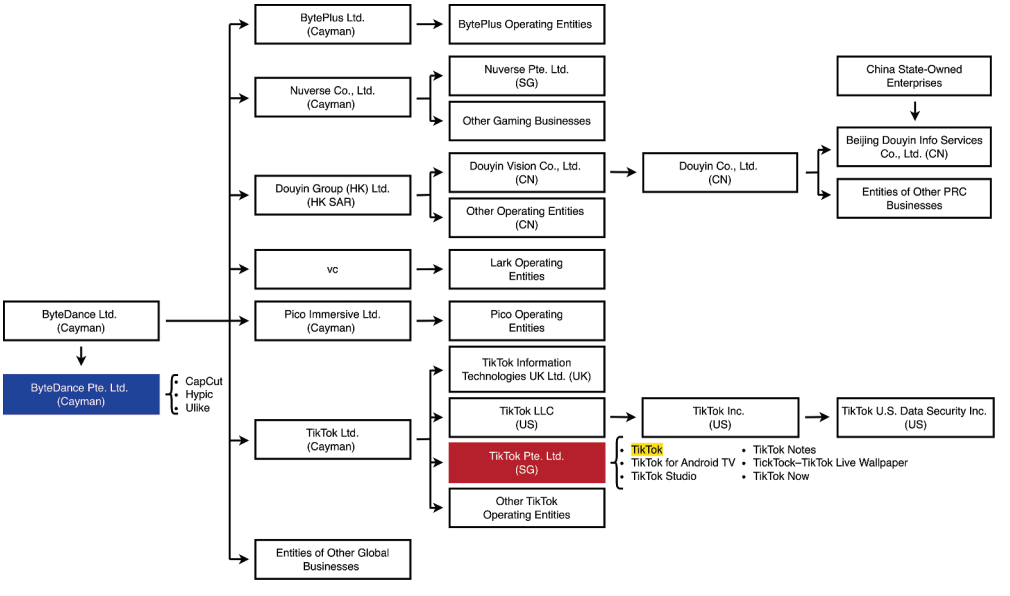

Figure 2. A simplified overview of the ByteDance Ltd. corporate structure, adapted from ByteDance (2024), showing TikTok as an app (yellow highlight), as a company (red), and as one of many subsidiaries held by its parent company ByteDance Ltd. (blue).

market (Kaye, Chen, and Zeng 2021). As with the TikTok app, platform scholars tend to concentrate on the app form of Douyin. They seldom deliberate Douyin's corporate owner, Douyin Group Ltd., or the bigger corporate ecosystem managed by ByteDance Ltd. that houses both the TikTok and Douyin apps. This, then, ignores the corporate ties between these two entities within the ByteDance Ltd. ecosystem. In this paper, we take a corporate ecosystem perspective to illustrate the relationships between the different corporate entities connected to the TikTok app.

Differentiating between the TikTok app and the company TikTok Ltd. is not simply a matter of semantics or a matter of geopolitics (cf. Bernot, Cooney-O'Donoghue, and Mann 2024). Rather, corporate distinctions become especially relevant when studying the launch, rollout, and management of platform tools because platform tools for the TikTok app are not only governed by TikTok Ltd. but by the many corporate players associated with the TikTok app. ByteDance Ltd. and its subsidiaries are connected economically, and, in many instances, infrastructurally through tools, leading to internal dependencies between subsidiaries. Therefore, if we ignore TikTok's corporate structure, we fail to see the economic and infrastructural dependencies set up by platform tools. Understanding these tool-mediated dependencies is important because of their role in amplifying power asymmetries between platform companies and their various user groups in cultural production. The following section explains how to adopt a second lens to better visualize the infrastructural dependencies associated with platform tools by tracing their evolution across software and hardware ecosystems.

TikTok as an assemblage of platform instances

By adopting an infrastructural perspective, we can see how TikTok Ltd. operates multiple 'platform instances' (Nieborg and Helmond 2019), or different software versions of its shortform video production products and services. The TikTok app and the browser version of TikTok are discrete examples of such instances; they both enable users to connect to TikTok Ltd.'s products and services from various interfaces and devices to access slightly different features. As seen in Figure 3, platform instances can be classified by the interface through which they are accessed, that is, platform instances can be 'app instances' or 'web instances' (Nieborg and Helmond 2019). For example, app instances are accessible through different digital marketplaces across devices: consider TikTok for Android TV, the TikTok app from the Google Play Store, and the TikTok app from Apple's App Store. Meanwhile, the browser version of TikTok (www.tiktok.com) is an example of a web instance. Generally, platform scholarship lumps all these institutionally distinct objects together.

The main motivation to break down TikTok into multiple instances is because it reveals tools that tend to be ignored among scholars. Some of these neglected tools can be found within the TikTok app instance, such as the libraries of photo effects and filters part of the TikTok app. Other tools can be accessed from within different app and web instances, like the editing software part of the TikTok Studio app (another app instance), or they can behave as their own platform instances, as 'standalone derivatives' of the platform (Nieborg and Helmond 2019). For instance, TikTok LIVE Studio (not to be confused with TikTok Studio) is a desktop app that does dual duty, operating as both a platform instance and a platform tool for producing streaming content. Platform tools

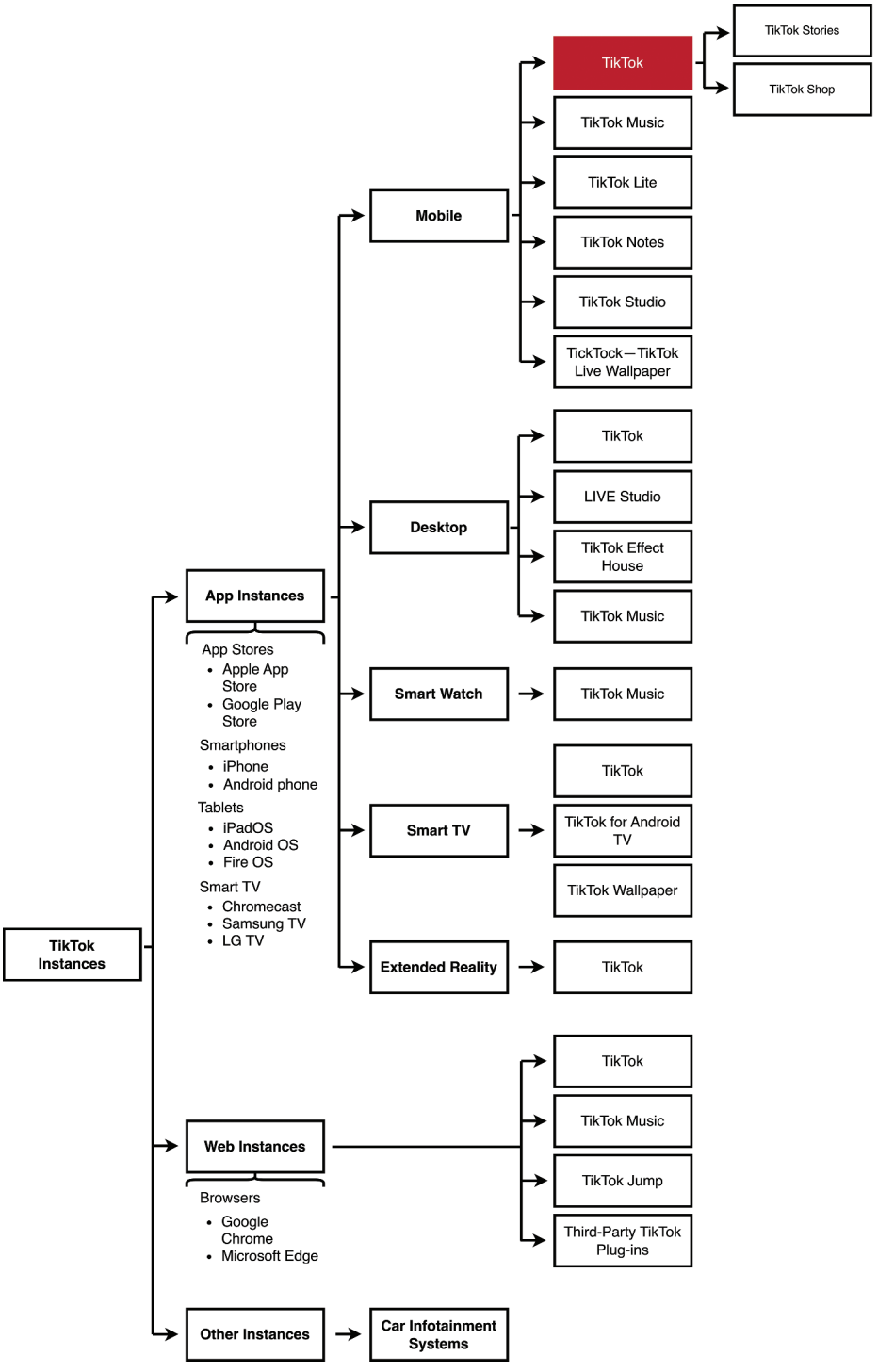

Figure 3. The TikTok app (red) situated within an assemblage of platform instances. Note that the instances available for a platform vary by geography and time.

that live within the LIVE Studio web instance also integrate directly with the TikTok app instance. The internal integration of platform tools within TikTok app and web instances and the external integration of tools across platform instances gives users more diverse suites of platform tools and allows platform companies to encroach further across software and hardware ecosystems, fuelling infrastructural growth.

Besides highlighting infrastructural relationships, another reason why the vocabulary of 'platform instances' is generative is because how platform tools are accessed, used, and managed varies across instances. For example, the instances that are accessed through the web do not require any native installations and are often conveniently available across devices for different operating systems and browsers. At the same time, web instances tend to be limited in features compared to native app instances. This variation makes the notion of 'instances' valuable for bracketing, contextualizing, and, subsequently, mapping changes to tools.

Next to being able to make analytical distinctions, our conceptual use of instances is meant to prompt critical reflections on how tools contribute to infrastructural expansion. They not only extend app instances, but they also connect them with other kinds of platform instances. Thus, when studying platform tools as 'assemblages of platform instances,' platform scholars may come to uncover how TikTok Ltd. achieves infrastructural growth. Taking a cue from a valuable intervention in the field of platform studies (Plantin et al. 2018), such growth can be characterized as the 'infrastructuralization of platforms' in which TikTok Ltd. supplants the infrastructure for creating, promoting, distributing, and monetizing shortform video content, or the 'platformization of infrastructure' in which critical infrastructure begins to adopt platform-like characteristics—e.g. news distribution companies embracing the data-centric logics associated with platform company TikTok Ltd. After having economically and infrastructurally situated tools, next we introduce information systems scholarship to analyze the evolution of platform tools more systematically.

The boundary resources framework

In a field closely related to strategic management, business scholars have offered the notion of 'boundary resources,' which 'serve as the interface for the arm's length relationship between the platform company owner and application developer' (Ghazawneh and Henfridsson 2013, 174). That is, such resources become key vehicles to govern those who establish economic or infrastructural relationships with platform companies. In this article, we position platform tools as boundary resources, which are governed via a dialectic process between the platform company and its third parties, and which are used to expand and 'secure' the platform company's boundaries (Ghazawneh and Henfridsson 2013). Since platform companies such as TikTok Ltd. for the most part do not create content themselves, they primarily grow by providing tools to external companies to make content, that is, to 'resource' complementary products and services (Ghazawneh and Henfridsson 2013). Using the TikTok app as an example, this may mean that TikTok Ltd. strategically offers developers platform tools (i.e. boundary resources), which developers then use to develop complementary services for the TikTok app. Developers, for example, can find tools on the TikTok for Developers web instance, which allows them to integrate external applications with the TikTok app. When platform companies open their

tools to 'resource' products and services from third parties, they must weigh this enabling act with the need to also 'secure' their infrastructural boundaries, in order to retain control over content distribution and their monetization efforts.

This balancing act between platform companies and third parties underscores the dynamic and relational nature of platform tools (i.e. boundary resources). To the first point: boundary resources and their underlying infrastructure are not static; they continually evolve as platform companies and platform users grapple with resourcing and securing the tools they need. Consequently, our analysis takes a historical approach to systematically produce timelines of evolving sets of boundary resources. Second, addressing the relational dimension: the resourcing and securing of boundary resources are processes shaped by a 'distributed tuning' process in which a network of platform user groups, including creators, developers, advertisers, and partners informs the creation and management of boundary resources (Eaton et al. 2015). Platform tools are not always in a phase where they are always equally accessible to all user groups, which speaks to the third reason as to why we employ the boundary resources framework, because it accounts for the contextual dimension of platform tools.

Who can access platform tools and when depends on contextual factors within and outside the control of the platform company. Platform companies can control contextual factors, including whether a platform tool is complete and deployed across jurisdictions or in an early stage of development and part of a geographically limited release. ByteDance Ltd. often relies on this corporate strategy, staggering the release of new tools and engaging in continuous experimentation with existing tools (Ma and Hu 2021). In view of this, we widen the boundary resources framework to account for whether platform tools are being tested, introduced, or modified (see Figure 4). Even during moments where platform tools are well-established, platform users may deem the tools inadequate if they require specific knowledge that is unavailable. This didactic dimension of tools—i.e. creators need to understand tools to be able to use themis accounted for in the boundary resources framework, which classifies technical guides, how-to videos, community forums, and workshops for software tools as 'social boundary resources' (Ghazawneh and Henfridsson 2013). Social boundary resources are in service of software tools, which information systems refers to as 'technical boundary resources' (Ghazawneh and Henfridsson 2013). While experimentation and the provision of technical and social boundary resources are within the purview of any platform company, there are external, contextual factors that lie beyond the company's control that affect boundary resource

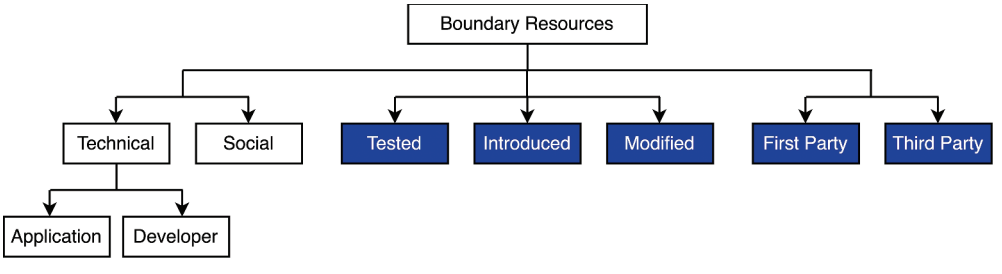

Figure 4. An expanded version of the boundary resources framework (blue) beside the initial boundary resources framework (white), adapted from Ghazawneh and Henfridsson (2013).

availability. Most prominent are regulatory events, including bans and privacy legislation. We include these in our mapping.

Contextual factors are significant as they can render first-party platform tools, i.e. those provided by the platform company, insufficient for creators. In such cases, platform users may resource their own (i.e. third-party) tools that are unsanctioned or not owned or permitted by the platform company. To incorporate the binary of sanctioned and unsanctioned, our analysis labels platform tools as either first party or third party (see Figure 4). This distinction demonstrates that while platform companies govern creators and their other user groups by setting access criteria for technical and social boundary resources, full control by the platform company over tools is inherently elusive, especially when external boundary resources are widely accessible. Next, we explain how to apply the expanded boundary resources framework to map the evolution of platform tools for the TikTok app. One caveat: the boundary resources framework in its original state is not specific to cultural production. To address this gap, we expand our analysis to encompass software tools and instructional resources specific to creators (e.g. editors, effects, AI plug-ins and related documentation).

Methodology

To gain empirical insight into boundary resources as sites of platform governance, we conduct a 'platform historiography' of the TikTok app (Helmond and van der Vlist 2019). This approach suggests creating a material platform history, which includes timelines of tool changes. Following guidance from the historiography literature, we take advantage of the many 'data traces' left behind by corporations and their corporate partners (Helmond and van der Vlist 2019). Our data sources include platform documentation, news articles, code repositories, community forums, and archival data from the Internet Archive's Wayback Machine. Because we are primarily interested in the TikTok app, we limit our data collection to platform tools directed at the app instance, beginning with the app's merger with Musical.ly in August 2018, and ending in June 2024. That is not to say that our approach neglects tools outside the app instance managed by TikTok Ltd. After all, not all tools are held within app instances nor are they all examples of app instances (think web instances,nor do they all fall under the regulatory purview of TikTok Ltd. (think third-party platform tools). Accordingly, we make note of any integrations outside the TikTok app instance and TikTok Ltd. app ecosystem. For our analysis, we use a three-step inductive coding process outlined by Eaton et al. (2015), which accounts for the dynamic, relational, and contextual nature of platform tool changes. Our timelines can be viewed in Figures A1–A12 in the Appendix.

For our analysis, we start by mapping the first-party platform tools that emerge through our investigation of TikTok Ltd. as a platform company and TikTok as collections of boundary resources. We view platform tools as dynamic, mapping tools over time (see A, Figure 5). Next, we survey how platform tools come into existence and how they are operationalized in relational environments. Though we are mainly interested in platform tools for creators, we recognize that tools often target multiple user groups as part of the 'distributed tuning' process (Eaton et al. 2015). As a result, we document other user groups that emerge in association with platform tools aimed at creators, positioning our first timeline of tools for creators against a secondary timeline of platform tools

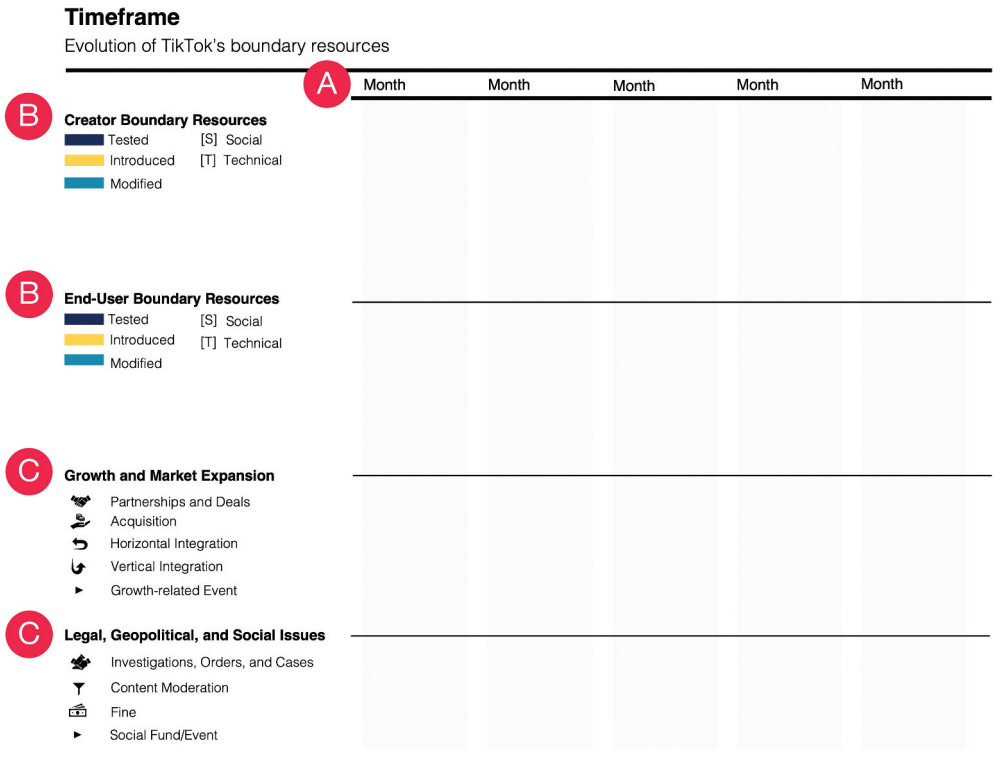

Figure 5. A platform historiography of platform tools associated with the TikTok app, accounting for the dynamic (A), relational (B), and contextual (C) nature of platform tools.

intended for end-users (see B, Figure 5). Lastly, we contextualize first-party platform tools, indicating the state of each tool (i.e. tested, introduced, modified) and whether the tool is a technical or social boundary resource. We also factor in changes to TikTok Ltd.'s corporate structure and the regulatory regimes governing TikTok Ltd. To that end, we construct two additional timelines, one recording the partnerships, acquisitions, horizontal integration, vertical integration, and other growth-related economic events contributing to the resourcing and securing of platform tools, and the other documenting regulatory events implicating TikTok Ltd. and ByteDance Ltd. such as fines and bans (see C, Figure 5). Lastly, in addition to first-party platform tools from TikTok Ltd., we examine third-party platform tools, noting changes to third-party tools, the user groups involved in their governance, and the contexts in which they are developed and governed.

Classifying platform tools for cultural production on the TikTok app

Our analysis reveals that most platform tools intended to facilitate cultural production are first-party platform tools, or tools sanctioned by TikTok Ltd. Unlike their unsanctioned, third-party counterparts, first-party platform tools continually evolve to become more comprehensive, more centralized, and more integrated across the many app and web instances managed by TikTok Ltd., ByteDance Ltd., and the subsidiaries held by

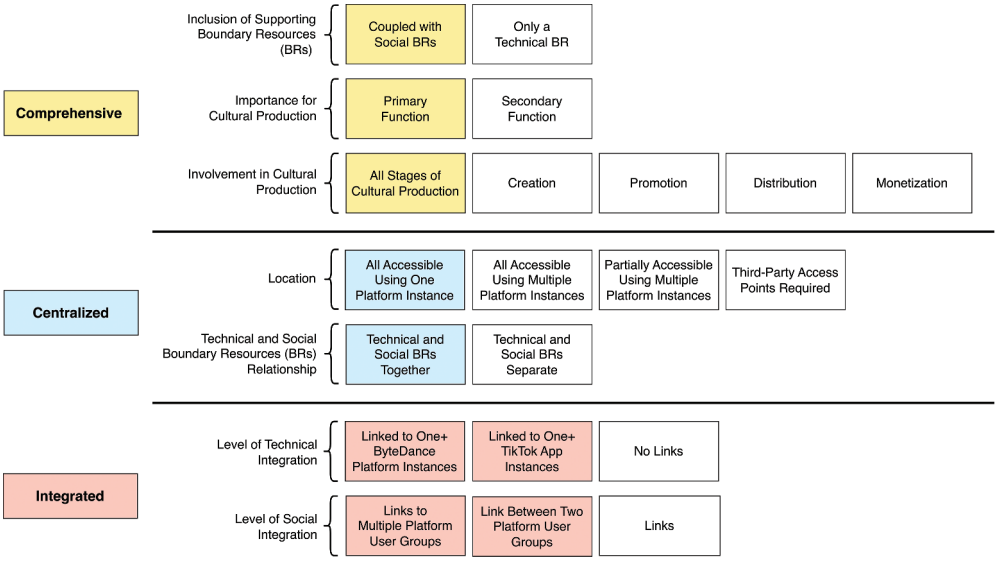

Figure 6. Platform tools as comprehensive, centralized, and integrated.

ByteDance Ltd. (see Figure 6). Our discussion begins by suggesting that first-party tools have become increasingly comprehensive, centralized, and integrated to encourage creators and other platform user groups to confine their workflows to tools within the platform ecosystem managed by TikTok Ltd. or associated corporate entities. We follow with reflections on our second category of platform tools, third-party platform tools, noting that the unsanctioned tools from third parties tend to be designed for tasks ancillary to cultural production, and in instances where third-party tools serve a primary function, they tend to be less directly connected to the TikTok app.

Sanctioned, first-party platform tools: comprehensive, centralized, and integrated

Since merging the TikTok app with Musical.ly in August 2018, TikTok Ltd. has worked to build a comprehensive set of first-party platform tools. We use the label comprehensive for when a platform company's toolkit (1) combines technical boundary resources with thorough instructions describing their use (detailed social boundary resources), (2) targets primary tasks such as filming and editing, and (3) encapsulates multiple stages of the cultural production process: creation, distribution, promotion, and monetization (see Figure 6). To address the first point: TikTok Ltd. from its inception has built out its suite of creator-centric technical and social boundary resources, both in breadth and in depth. For example, TikTok Ltd. introduced the Creator Portal in January 2021 to link technical boundary resources to many social ones instructing aspiring and established creators on skills and strategies for successful shortform video creation. Over the next three years, TikTok Ltd. updated the Creator Portal to include more informational content for a larger number of tools (e.g. community effects, TikTok Shop monetization tools). Eventually, in March 2024, TikTok Ltd. replaced the Creator Portal with the even more well-equipped Creator Academy. Many of the technical and social boundary resources being supplied by

TikTok Ltd. fulfill primary roles, the second characteristic of a comprehensive toolkit. By primary, we mean the tools serve a critical function, are used frequently, or affect content quality or efficiency during the cultural production process (e.g. the TikTok app's in-app camera and in-app editor). To the third and final point of why we view TikTok Ltd. as a supplier of comprehensive tool suites is because the company's technical and social boundary resources cover multiple steps essential to the cultural production process; they are all-encompassing. Case in point: for content creation TikTok Ltd. provides a camera, video trimmers, and effects; for promotion TikTok Ltd. includes hashtags and mentions; for distribution TikTok Ltd. offers share buttons and links for exporting; and for monetization the company displays dashboards with user and revenue analytics. In providing such a comprehensive suite of platform tools, TikTok Ltd. encourages creators to restrict their resourcing to its platform instances.

Second, as the breadth and depth of TikTok Ltd.'s first-party platform tools increased, the company packaged individual tools into centralized suites targeted at specific groups of third parties. This way, the company could direct its various groups of users to a central location containing all the technical and social boundary resources they needed. Initially, TikTok Ltd.'s centralization strategies varied by group. For example, software developers and advertisers were each given their own centralized suites of resources, labelled explicitly for their use (e.g. TikTok for Developers introduced in November of 2019 and TikTok for Business announced in June of 2020). These resources were disseminated through multiple app and web instances but remained centralized. The many platform instances simply meant more access points to the centralized tool suite. Tools for creators too followed the logic of centralization but were managed differently.

Prior to 2019, platform tools specific to creators were positioned as features intrinsic to and housed within the TikTok app, a centralized location to supposedly simplify and 'democratize' cultural production. Unlike the centralized tool suites for developers and advertisers, tools for content creation were not explicitly tagged as 'tools for creators.' As a discursive strategy, avoiding labels implied that any end-user had the potential to transition from audience member to creator. In 2021, TikTok Ltd. pivoted its strategy for creator tools to resemble the approach it used for its developer and advertising tool suites, introducing the Creator Portal in January and the Creator Next program in December. These two sets of resources did name creators as their intended user group and were originally centrally integrated with web instances. After 2022, TikTok Ltd. began setting up other dedicated app instances to target creators—e.g. TikTok Notes tested in April 2024 and TikTok Studio released in May 2024. On the surface, the creation of many new app instances seems to decentralize platform tools. In practice, a higher number of app and web instances translates to more access points to infrastructurally centralized resources for a variety of users.

Third, next to being comprehensive and centralized, platform tools are integrated across software ecosystems within and outside the app ecosystem managed by TikTok Ltd. They connect multiple platform instances (technical integration) and multiple user groups (social integration). At the level of technical integration within the TikTok Ltd. app ecosystem, TikTok Ltd. ensures that the software powering its platform tools is interoperable and compatible across its many platform instances. Outside its app ecosystem, within the ByteDance Ltd. ecosystem for instance, TikTok Ltd. and ByteDance Ltd. integrate their platform tools; at the software level they incorporate logins from different apps, at the

functional level they develop similar tools across apps, and at the aesthetic level they use common branding and a shared design for the creator interface. By integrating the software, functions, and aesthetics associated with platform tools across platform instances, TikTok Ltd. begins to connect its different user groups, engaging in social integration. That is, by tying different platform instances together, platform tools also bring together diverse user groups. For example, the TikTok Creator Marketplace, through its centralized social boundary resources, brings together creators and brands, increasing the number and types of opportunities for creators to monetize content. The monetization opportunities that stem from integrating numerous platform instances, along with the comprehensive and centralized nature of first-party platform tools from TikTok Ltd., imply that TikTok creators are heavily dependent on the tools within the ambit of TikTok Ltd., ByteDance Ltd., and ByteDance Ltd. subsidiaries. But the existence of third-party platform tools suggests otherwise.

Unsanctioned, third-party platform tools: secondary or disconnected

Recall that tool management is a distributed tuning process between creators, platform companies, and other platform user groups (Eaton et al. 2015). In other words, platform companies are constantly negotiating the need to resource products and services from third parties with the need to secure their infrastructural boundaries. Creators who find TikTok Ltd.'s tools limiting are not without agency, however, nor is tool governance a top-down process. Creators can devise strategies to self-resource, obtaining their own tools. Two categories of such third-party resources emerge as part of our analysis: (1) tools from individual developers and creators, which fulfill functions secondary to the cultural production process and (2) comprehensive tools from well-resourced start-ups and incumbents that are largely disconnected from the TikTok app ecosystem. The first type includes tool with functions that are supplementary to the cultural production process, for example, scraping TikTok data, removing watermarks, and increasing the length of TikTok videos. Eventually, they tend to be made obsolete by TikTok Ltd.'s in-app equivalents (e.g. TikTok's Save Without Watermark feature introduced in March 2024, the increase in video length to 10 minutes in February 2022). These third-party tools are rarely comprehensive, and they are seldom centralized or easily integrated with the TikTok app. In contrast, there is a second group of third-party platform tools, typically managed by start-ups and incumbent firms. These two groups of corporate actors have the financial means to supply and maintain comprehensive third-party platform tools, usually in the format of app instances. While such third-party toolsets may also be comprehensive and they may centralize technical and social boundary resources into single app instances, the tools struggle to integrate with the TikTok app. Even in cases where third-party platform tools are purposefully designed to integrate with the TikTok app, they usually do not see the same adoption rates as apps held by TikTok Ltd. For example, third-party apps like 'Filters for TikTok—PhotoPic' or 'Captions for TikTok' have limited downloads. Despite lower adoption among creators, third-party platform tools do attract well-established creators looking to self-resource (e.g. the D'Amelio family partnering with third-party editing app Lightricks). In a winner-take-all market, attracting the capital needed to invest in third-party platform tools presents a challenge; when creators cannot invest, they join multiple platforms so that they are not so reliant on any one platform company (Poell, Nieborg,

and Duffy 2021). How tools play into this strategy, however, is not well-understood and provides fertile ground for future scholarship.

Reflecting on resourcing and securing: how platform tools facilitate platform growth

Our empirical analysis thus far focused on characterizing platform tools for the TikTok app. Let us now reflect on how platform tools have evolved, and how resourcing platform tools grows TikTok, both as a company and as an assemblage of platform instances. What our historical analysis of TikTok's evolving boundary resources makes clear is that TikTok Ltd. resources platform tools from both inside its own infrastructure, as well as from outside by forming business relationships with third-party companies. When resourcing tools through partnerships, TikTok Ltd. contributes directly to the 'platformization of cultural production' (Nieborg and Poell 2018) and other societal sectors. First, many of the partnerships TikTok Ltd. relies on to resource tools are with companies situated in the cultural industries (e.g. February 2024 partnership with Adobe for professional video production). These ties allow TikTok Ltd. to capture various markets tied to cultural production (e.g. publishing, music, gaming). Only a handful of the company's partnerships are with firms outside the cultural industries. For example, in August of 2021 TikTok Ltd. partnered with the e-commerce platform company Shopify to fashion a tool for embedding product links into TikTok profiles. By September 2023, the e-commerce venture had transitioned from a simple in-app link into a full-fledged e-commerce instance called TikTok Shop. Here we see an illustration of how TikTok Ltd. resources platform tools to tap into the expertise, products, and services of third parties, successfully manoeuvring into industries within and outside the cultural sector—in other words, engaging in platformization.

In the process of resourcing platform tools, TikTok Ltd. not only pushes its economic and governmental logics across industries, but it also begins to extend and supplant critical infrastructure for cultural production—i.e. infrastructuralization. Early on, TikTok Ltd. emphasized its desire to become a key infrastructure for content creation, unlike its competitors at the time, as made apparent in our mapping of creator-centric tools (see Figures A1–A12 in the Appendix). Over time, the company resourced an increasing number of tools from third parties, its users (e.g. augmented reality effects from creators), and its parent company (e.g. CapCut for video editing from ByteDance Ltd.). This resourcing strategy produced comprehensive, centralized, and integrated suites of platform tools. The TikTok app alone, for example, contains all the tools needed to film, edit, promote, and monetize content. Creators interested in more functionality and more granular control over the process of shortform video production can access additional tools through other app and web instances that remain infrastructurally integrated with the TikTok app. Connecting various platform instances ultimately became a way for ByteDance Ltd. and TikTok Ltd. to expand as infrastructure, while, crucially, securing their boundaries.

Conclusion

Time and time again, TikTok Ltd. has emphasized the importance of platform tools and its role in supplying its various user groups with tools:

> TikTok's commitment is to give you access to the best technology and creative tools so you can realize your full potential—as artists, educators, business owners, advocates, or any other way you choose to make your mark and live your dreams. (Presser 2024)

Platform tools are undeniably critical to the work of creators and other user groups, from developers to advertisers. Therefore, TikTok Ltd. governs its platform tools strategically, prioritizing economic and infrastructural growth. We call on platform scholars to consider the mapping of platform tools—the dynamics that render tools increasingly comprehensive, centralized, and integrated, and the consequences these dynamics have for different platform user groups.

In our methodology, we stressed the dynamic, relational, and contextual nature of platform tools. We recognize that platform tools are dynamic; they will continue to evolve. For example, countless tools have emerged since technology company OpenAI released the AI-powered chatbot ChatGPT in November of 2022. How TikTok Ltd. and ByteDance Ltd. modify their toolkits in light of the shift towards AI technologies has yet to be explored. This question is particularly relevant because of TikTok Ltd.'s relationship to ByteDance Ltd., a company with strong computational roots in machine learning and AI. The exact implications of platform tool governance, with the rise in AI, remains ambiguous. Changes to platform tools due to AI may change creators' experiences of autonomy, authenticity, creativity, and platform dependence, and in the process, revise their relationships with platform tools, other platform user groups, and their audiences. Here, a relational understanding of tools is useful. We advocate that future studies of platform tools consider relationality by consulting creators, examining how they navigate limitations in technical and social boundary resources and tool-based dependencies.

As AI tools—and platform tools generally—are not developed and governed in vacuums, we also suggest that platform scholars frame tools as contextual, grounding their tool analyses in the political economic and infrastructural contexts in which tools emerge—something we aimed to do. Context is especially significant when studying platform tools associated with AI and the TikTok app as both have become major points of contention in geopolitical clashes and have repeatedly been the subject of regulatory concern. We also ask platform scholars to critically reflect on the binaries that segment TikTok into the domestic (China) market and the international market and to avoid homogenizing 'international' to the North American and European contexts (Poell et al. 2025). In short, we recommend platform scholars foreground platform tools for more critical studies of platform companies and platform infrastructure. As shown in this empirical contribution to platform and TikTok studies, platform tools are helpful for unpacking the processes of platformization, infrastructuralization, and the future of platform-dependent cultural production.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

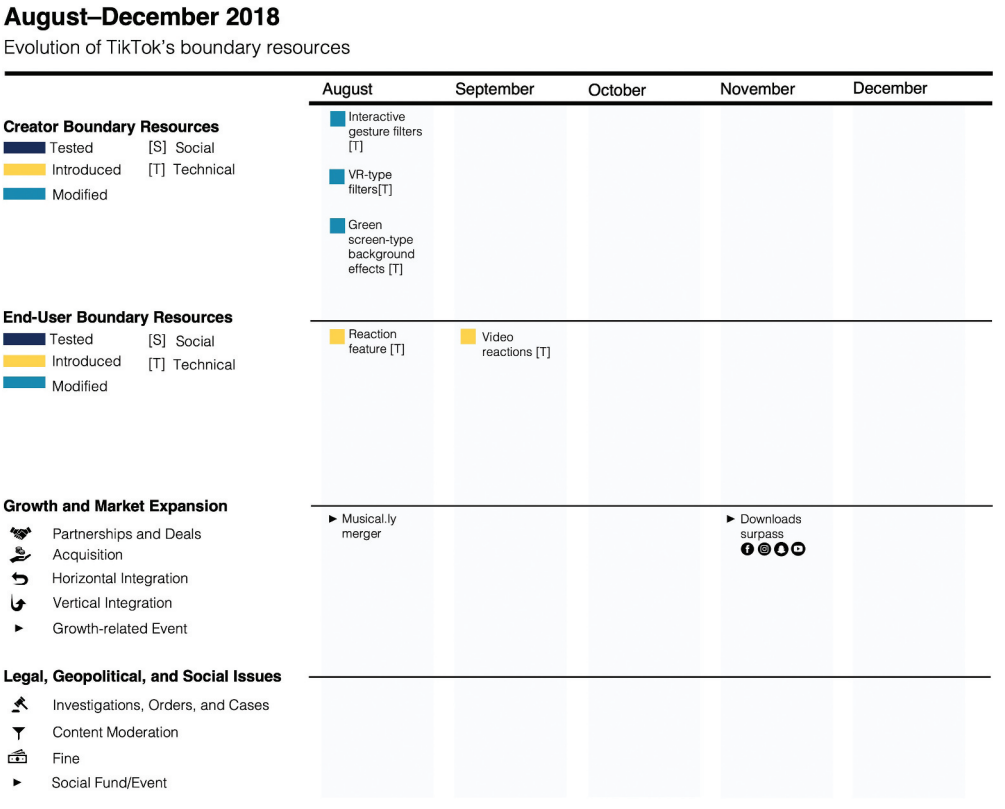


Figure A1.

January–June 2019

Evolution of TikTok's boundary resources

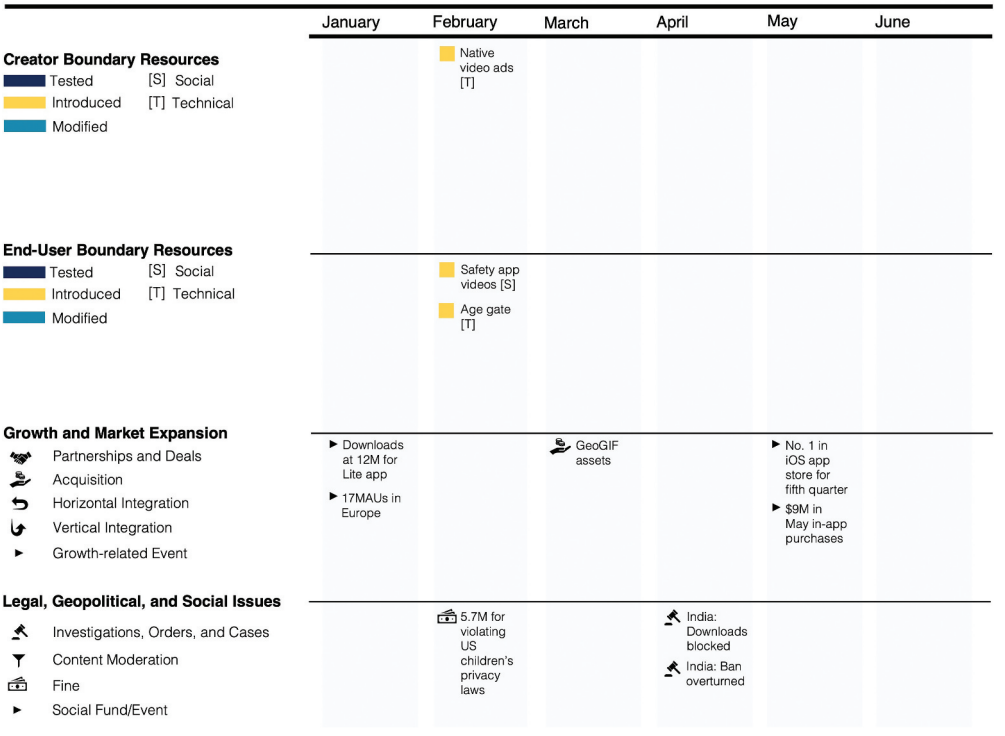


Figure A2.

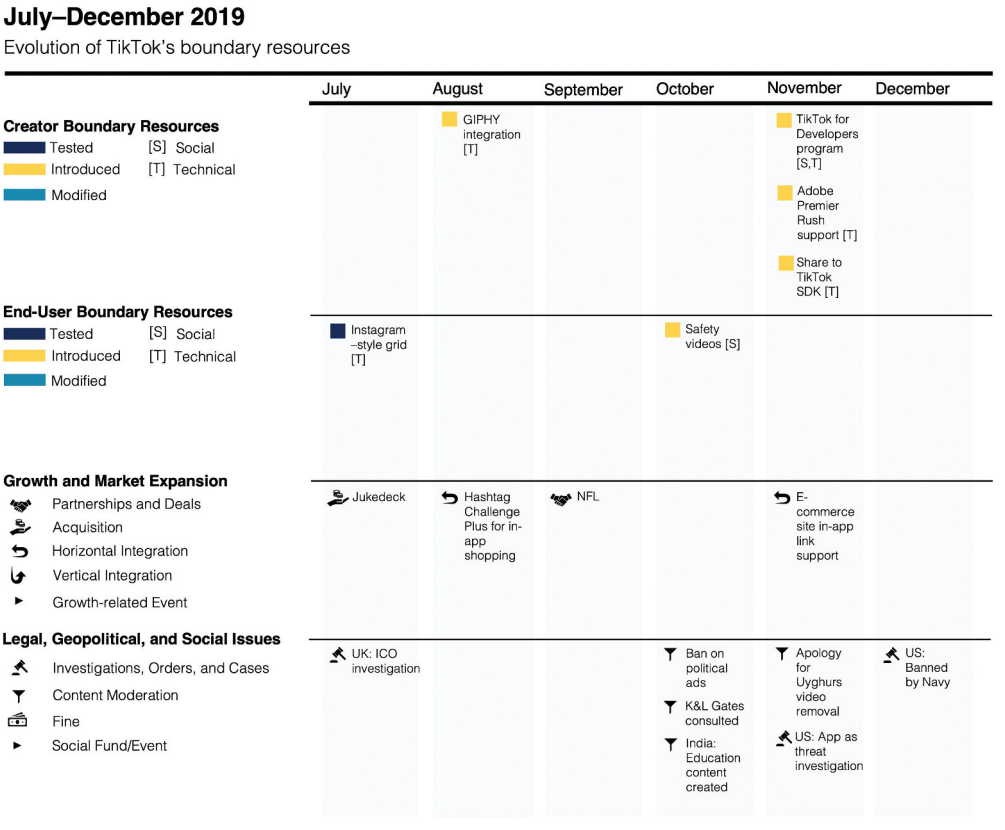
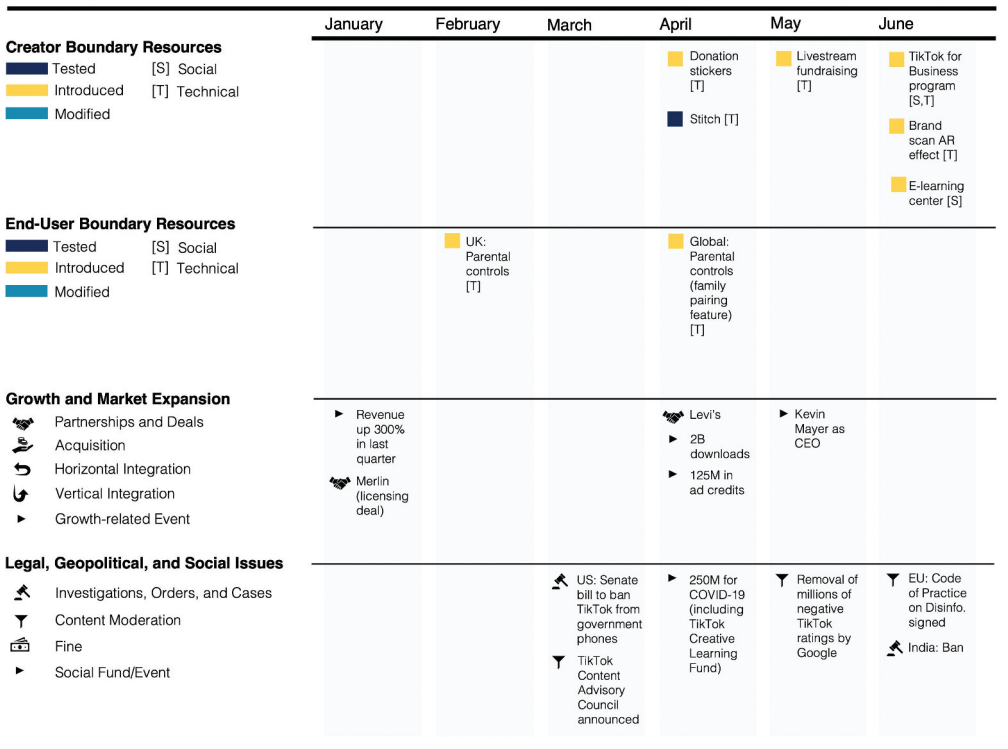

July–December 2019
Evolution of TikTok's boundary resources
July
August
September
October
November
December
Creator Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
GIPHY integration [T]
TikTok for Developers program [S,T]
Adobe Premier Rush support [T]
Share to TikTok SDK [T]
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Instagram –style grid [T]
Safety videos [S]
Growth and Market Expansion
Partnerships and Deals
Acquisition
Horizontal Integration
Vertical Integration
Growth-related Event
Jukedeck
Hashtag Challenge Plus for in-app shopping
NFL
E-commerce site in-app link support
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
UK: ICO investigation
Ban on political ads
K&L Gates consulted
India: Education content created
Apology for Uyghurs video removal
US: App as threat investigation
US: Banned by Navy

Figure A3.


January–June 2020
Evolution of TikTok's boundary resources
Creator Boundary Resources
Tested
Introduced
Modified
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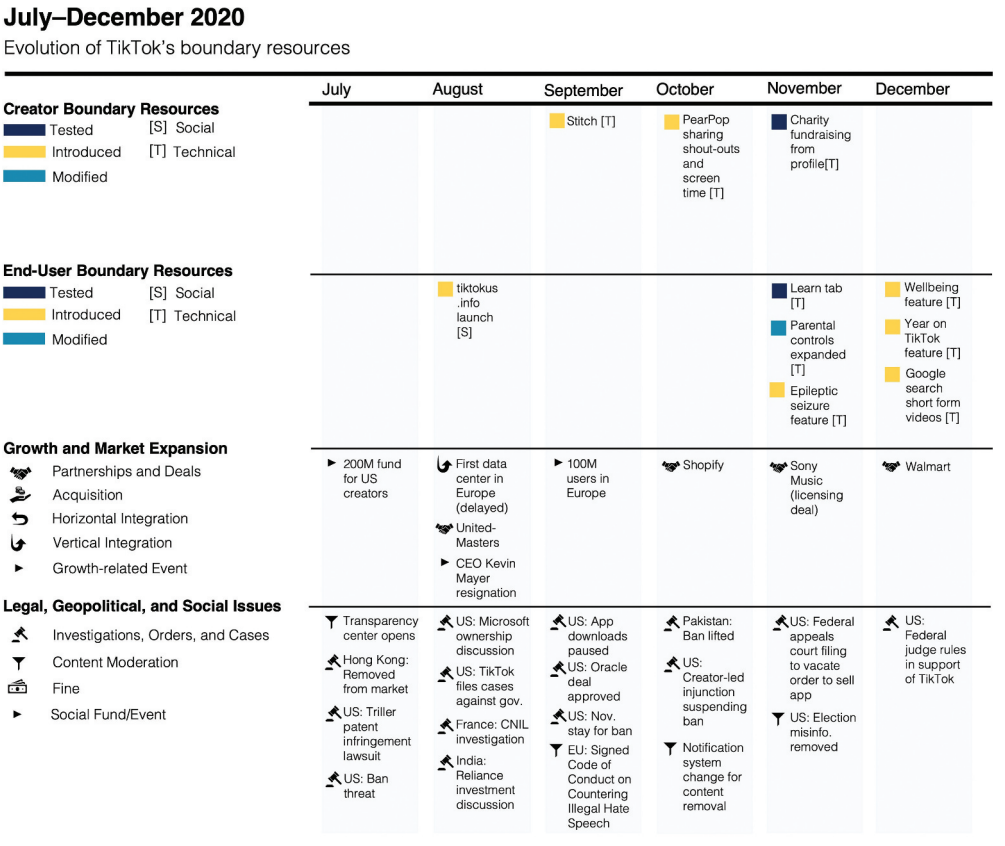
[T] Technical
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Growth and Market Expansion
Partnerships and Deals
Acquisition
Horizontal Integration
Vertical Integration
Growth-related Event
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
January
February
March
April
May
June
Revenue up 300% in last quarter
Merlin (licensing deal)
UK: Parental controls [T]
US: Senate bill to ban TikTok from government phones
TikTok Content Advisory Council announced
Donation stickers [T]
Stitch [T]
Global: Parental controls (family pairing feature) [T]
Levi's
2B downloads
125M in ad credits
250M for COVID-19 (including TikTok Creative Learning Fund)
Livestream fundraising [T]
Kevin Mayer as CEO
Removal of millions of negative TikTok ratings by Google
TikTok for Business program [S,T]
Brand scan AR effect [T]
E-learning center [S]
EU: Code of Practice on Disinfo. signed
India: Ban

Figure A4.


July–December 2020
Evolution of TikTok's boundary resources
Creator Boundary Resources
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Modified
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[T] Technical
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Growth and Market Expansion
Partnerships and Deals
Acquisition
Horizontal Integration
Vertical Integration
Growth-related Event
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
July
August
September
October
November
December
Stitch [T]
PearPop sharing shout-outs and screen time [T]
Charity fundraising from profile[T]
tiktokus .info launch [S]
Learn tab [T]
Parental controls expanded [T]
Epileptic seizure feature [T]
Wellbeing feature [T]
Year on TikTok feature [T]
Google search short form videos [T]
200M fund for US creators
First data center in Europe (delayed)
United-Masters
CEO Kevin Mayer resignation
100M users in Europe
Shopify
Sony Music (licensing deal)
Walmart
Transparency center opens
Hong Kong: Removed from market
US: Triller patent infringement lawsuit
US: Ban threat
US: Microsoft ownership discussion
US: TikTok files cases against gov.
France: CNIL investigation
India: Reliance investment discussion
US: App downloads paused
US: Oracle deal approved
US: Nov. stay for ban
EU: Signed Code of Conduct on Countering Illegal Hate Speech
Pakistan: Ban lifted
US: Creator-led injunction suspending ban
Notification system change for content removal
US: Federal appeals court filing to vacate order to sell app
US: Election misinfo. removed
US: Federal judge rules in support of TikTok

Figure A5.

January–June 2021
Evolution of TikTok's boundary resources

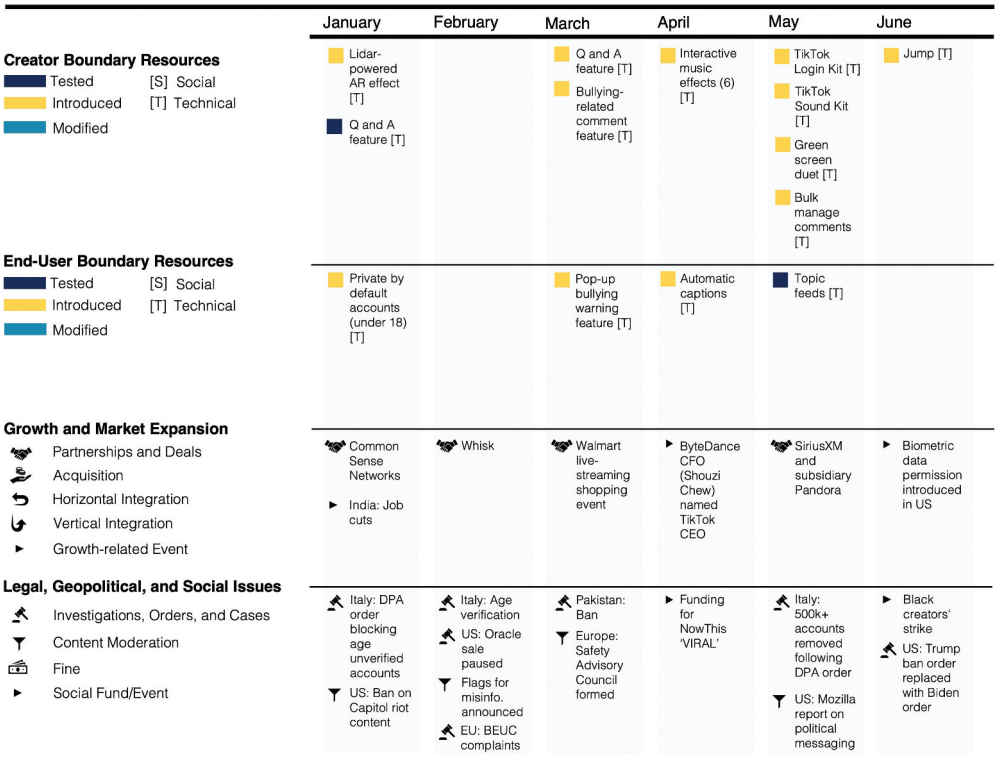
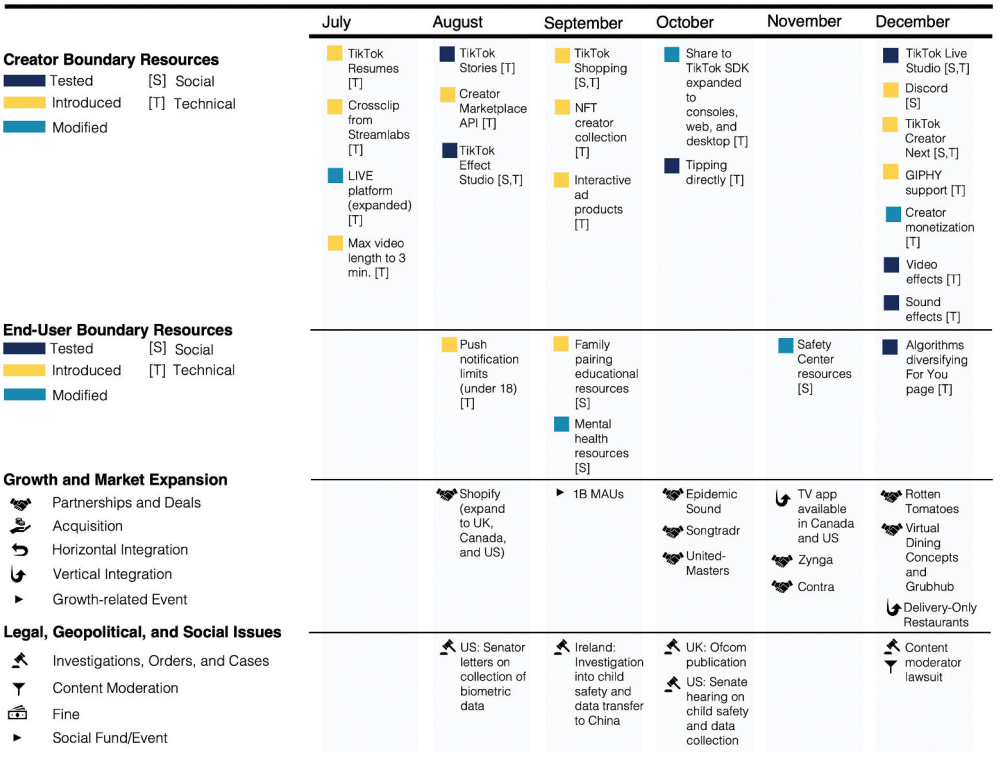


Figure A6.

July–December 2021

Evolution of TikTok's boundary resources



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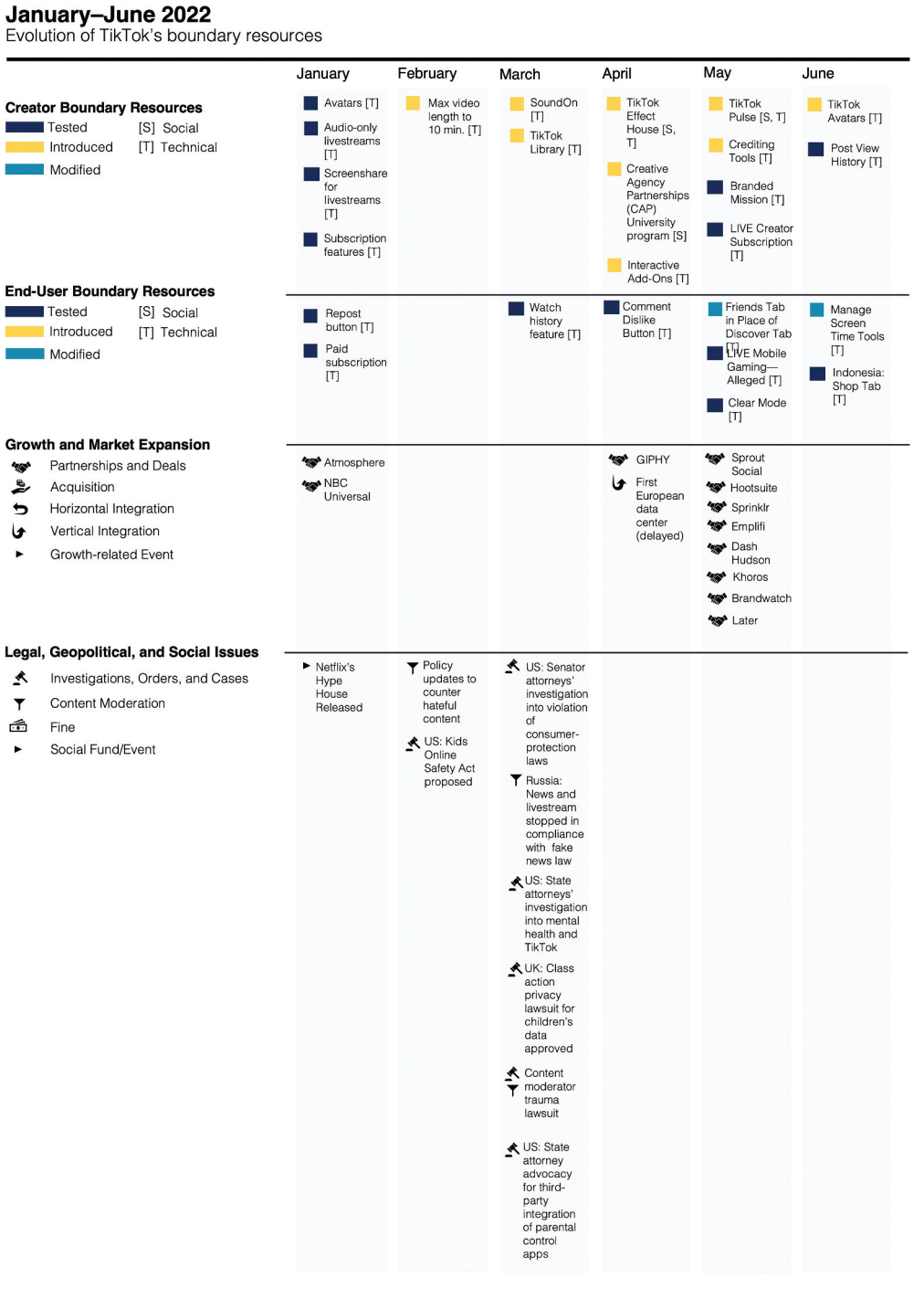

January–June 2022
Evolution of TikTok's boundary resources
Creator Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Growth and Market Expansion
Partnerships and Deals
Acquisition
Horizontal Integration
Vertical Integration
Growth-related Event
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
January
Avatars [T]
Audio-only livestreams [T]
Screenshare for livestreams [T]
Subscription features [T]
Repost button [T]
Paid subscription [T]
Atmosphere
NBC Universal
Netflix's Hype House Released
February
Max video length to 10 min. [T]
Policy updates to counter hateful content
US: Kids Online Safety Act proposed
March
SoundOn [T]
TikTok Library [T]
Watch history feature [T]
US: Senator attorneys' investigation into violation of consumer-protection laws
Russia: News and livestream stopped in compliance with fake news law
US: State attorneys' investigation into mental health and TikTok
UK: Class action privacy lawsuit for children's data approved
Content moderator trauma lawsuit
US: State attorney advocacy for third-party integration of parental control apps
April
TikTok Effect House [S, T]
Creative Agency Partnerships (CAP) University program [S]
Interactive Add-Ons [T]
Comment Dislike Button [T]
GIPHY
First European data center (delayed)
May
TikTok Pulse [S, T]
Crediting Tools [T]
Branded Mission [T]
LIVE Creator Subscription [T]
Friends Tab in Place of Discover Tab [T]
LIVE Mobile Gaming—Alleged [T]
Clear Mode [T]
Sprout Social
Hootsuite
Sprinklr
Emplifi
Dash Hudson
Khoros
Brandwatch
Later
June
TikTok Avatars [T]
Post View History [T]
Manage Screen Time Tools [T]
Indonesia: Shop Tab [T]

Figure A8.

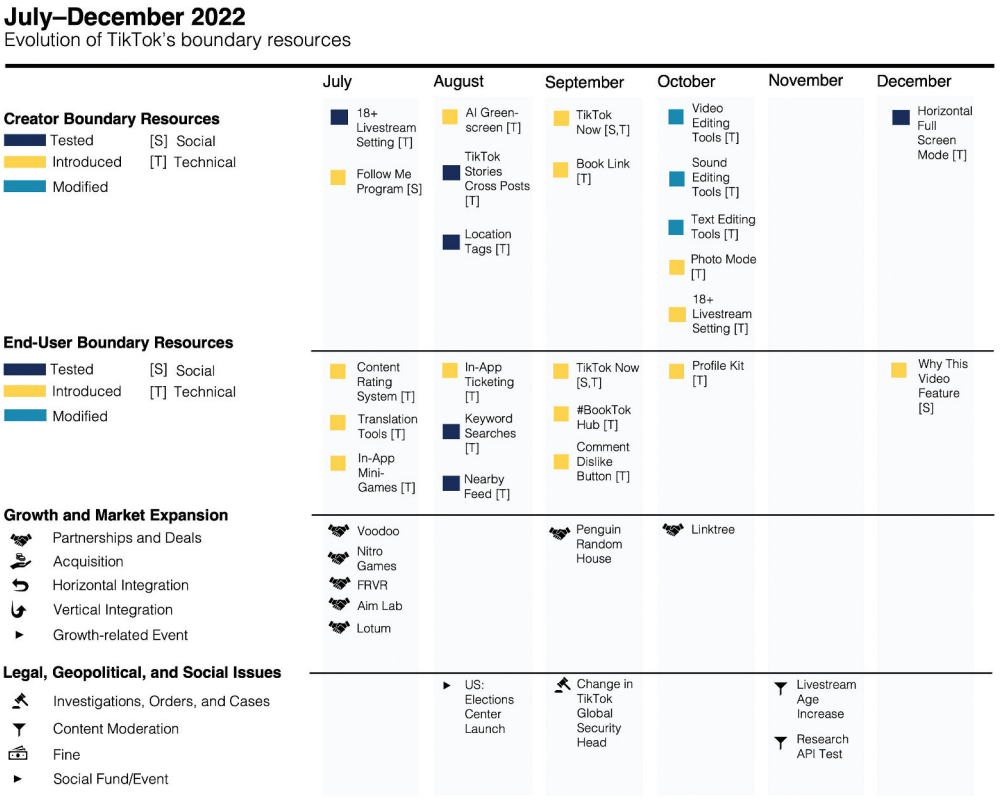

July–December 2022
Evolution of TikTok's boundary resources
July
August
September
October
November
December
Creator Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
18+ Livestream Setting [T]
Follow Me Program [S]
AI Green-screen [T]
TikTok Stories Cross Posts [T]
Location Tags [T]
TikTok Now [S,T]
Book Link [T]
Video Editing Tools [T]
Sound Editing Tools [T]
Text Editing Tools [T]
Photo Mode [T]
18+ Livestream Setting [T]
Horizontal Full Screen Mode [T]
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Content Rating System [T]
Translation Tools [T]
In-App Mini-Games [T]
In-App Ticketing [T]
Keyword Searches [T]
Nearby Feed [T]
TikTok Now [S,T]
#BookTok Hub [T]
Comment Dislike Button [T]
Profile Kit [T]
Why This Video Feature [S]
Growth and Market Expansion
Partnerships and Deals
Acquisition
Horizontal Integration
Vertical Integration
Growth-related Event
Voodoo
Nitro Games
FRVR
Aim Lab
Lotum
Penguin Random House
Linktree
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
US: Elections Center Launch
Change in TikTok Global Security Head
Livestream Age Increase
Research API Test

Figure A9.

January–June 2023
Evolution of TikTok's boundary resources

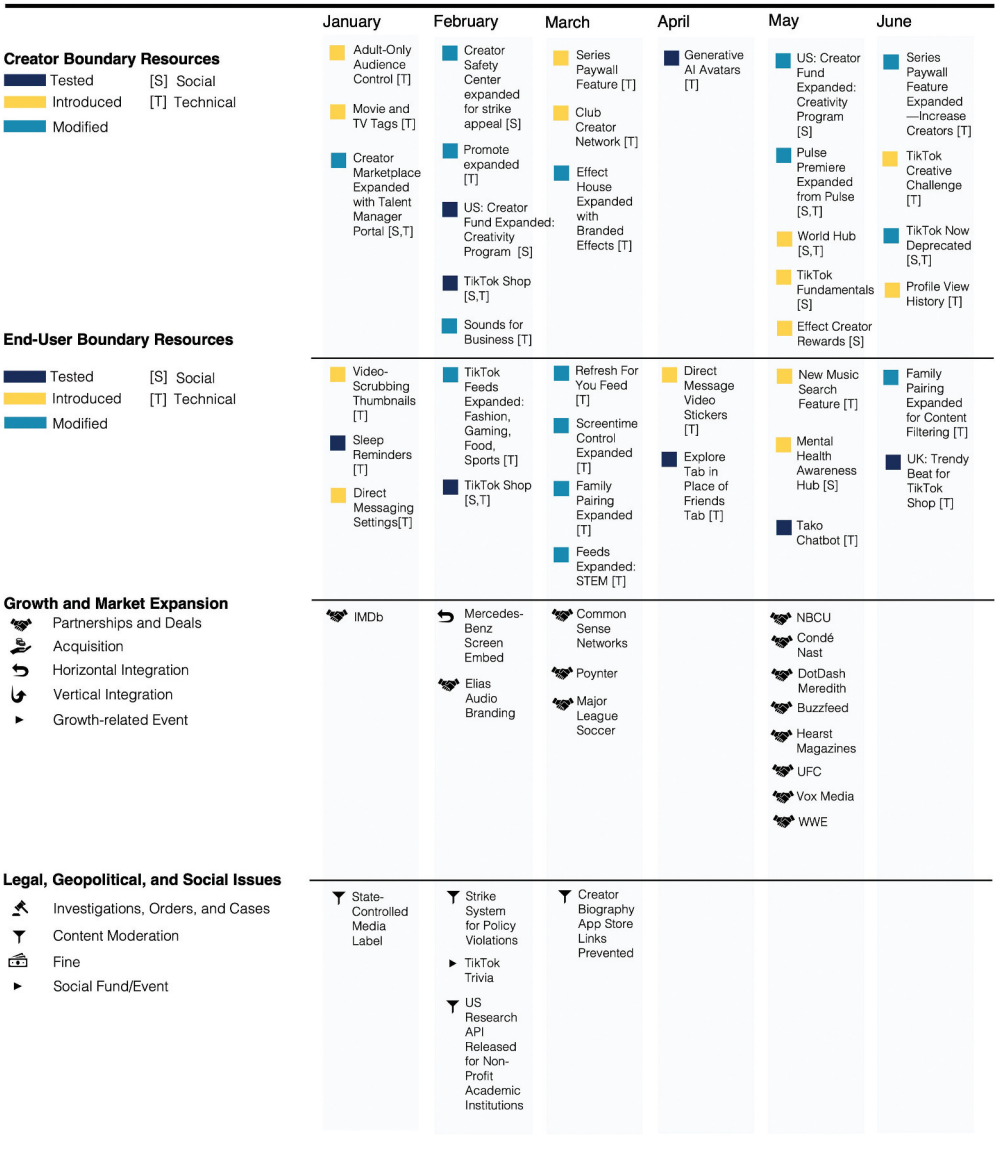
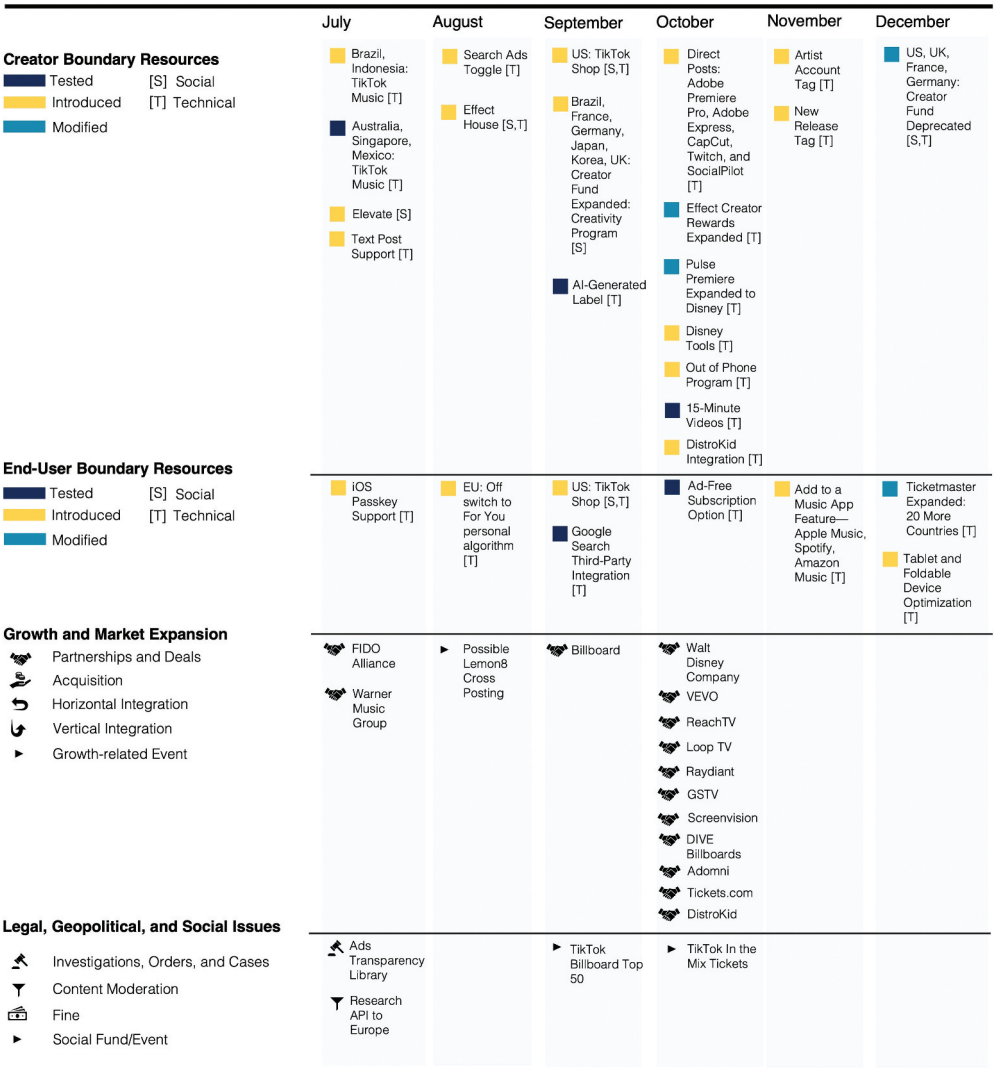


Figure A10.


July–December 2023
Evolution of TikTok's boundary resources
July
August
September
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November
December
Creator Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
Brazil, Indonesia: TikTok Music [T]
Australia, Singapore, Mexico: TikTok Music [T]
Elevate [S]
Text Post Support [T]
Search Ads Toggle [T]
Effect House [S,T]
US: TikTok Shop [S,T]
Brazil, France, Germany, Japan, Korea, UK: Creator Fund Expanded: Creativity Program [S]
AI-Generated Label [T]
Direct Posts: Adobe Premiere Pro, Adobe Express, CapCut, Twitch, and SocialPilot [T]
Effect Creator Rewards Expanded [T]
Pulse Premiere Expanded to Disney [T]
Disney Tools [T]
Out of Phone Program [T]
15-Minute Videos [T]
DistroKid Integration [T]
Artist Account Tag [T]
New Release Tag [T]
US, UK, France, Germany: Creator Fund Deprecated [S,T]
End-User Boundary Resources
Tested
Introduced
Modified
[S] Social
[T] Technical
iOS Passkey Support [T]
EU: Off switch to For You personal algorithm [T]
US: TikTok Shop [S,T]
Google Search Third-Party Integration [T]
Ad-Free Subscription Option [T]
Add to a Music App Feature—Apple Music, Spotify, Amazon Music [T]
Ticketmaster Expanded: 20 More Countries [T]
Tablet and Foldable Device Optimization [T]
Growth and Market Expansion
Partnerships and Deals
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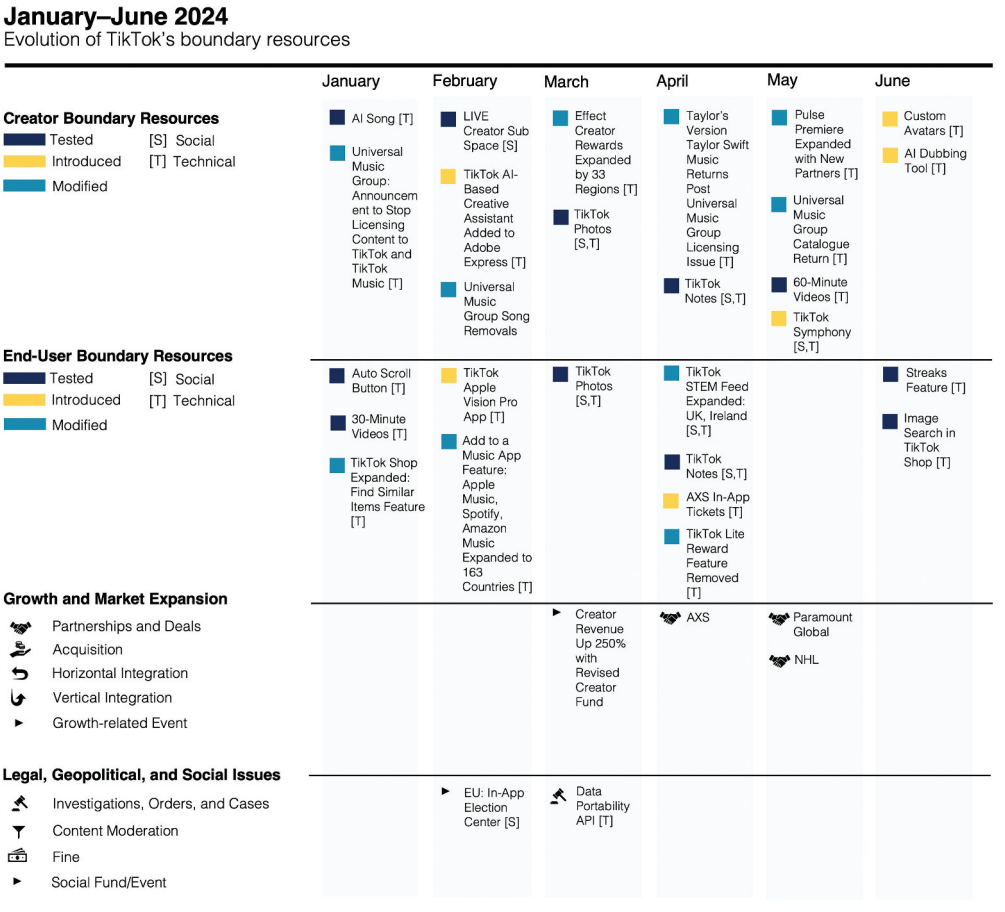
Vertical Integration
Growth-related Event
FIDO Alliance
Warner Music Group
Possible Lemon8 Cross Posting
Billboard
Walt Disney Company
VEVO
ReachTV
Loop TV
Raydiant
GSTV
Screenvision
DIVE Billboards
Adomni
Tickets.com
DistroKid
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
Ads Transparency Library
Research API to Europe
TikTok Billboard Top 50
TikTok In the Mix Tickets

Figure A11.


January–June 2024
Evolution of TikTok's boundary resources
Creator Boundary Resources
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[T] Technical
End-User Boundary Resources
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[T] Technical
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Vertical Integration
Growth-related Event
Legal, Geopolitical, and Social Issues
Investigations, Orders, and Cases
Content Moderation
Fine
Social Fund/Event
January
AI Song [T]
Universal Music Group: Announcement to Stop Licensing Content to TikTok and TikTok Music [T]
Auto Scroll Button [T]
30-Minute Videos [T]
TikTok Shop Expanded: Find Similar Items Feature [T]
February
LIVE Creator Sub Space [S]
TikTok AI-Based Creative Assistant Added to Adobe Express [T]
Universal Music Group Song Removals
TikTok Apple Vision Pro App [T]
Add to a Music App Feature: Apple Music, Spotify, Amazon Music Expanded to 163 Countries [T]
EU: In-App Election Center [S]
March
Effect Creator Rewards Expanded by 33 Regions [T]
TikTok Photos [S,T]
TikTok Photos [S,T]
Creator Revenue Up 250% with Revised Creator Fund
Data Portability API [T]
April
Taylor's Version Taylor Swift Music Returns Post Universal Music Group Licensing Issue [T]
TikTok Notes [S,T]
TikTok STEM Feed Expanded: UK, Ireland [S,T]
TikTok Notes [S,T]
AXS In-App Tickets [T]
TikTok Lite Reward Feature Removed [T]
AXS
May
Pulse Premiere Expanded with New Partners [T]
Universal Music Group Catalogue Return [T]
60-Minute Videos [T]
TikTok Symphony [S,T]
Paramount Global
NHL
June
Custom Avatars [T]
AI Dubbing Tool [T]
Streaks Feature [T]
Image Search in TikTok Shop [T]

Figure A12.