Apps and politics

Introduction

The average Canadian adult spends close to three hours on their mobile phones every single day. Canadians are far from unique in this regard. Most if not all countries across the globe, regardless of their economic development or mode of government, have seen the rapid diffusion and adoption of mobile Internet technology. Whether checking for new messages, playing a game or hailing a ride, the use of mobile software applications – or apps – has become habitual. The apps used in these everyday practices are best understood as "mundane software", which highlights their "mobility, ubiquity, and ready accessibility" (Morris & Murray, 2018, p. 9). Mundane does not mean trivial, neither in an economic nor a cultural sense. After all, according to an Apple press release, its app store ecosystem facilitated over half a trillion dollars in commerce in 2019 (Apple, 2020). Or, to measure a mobile phone's sociocultural impact, ask any user if they are willing to go without their mobile device for a week.

As suggested by Apple, apps and app stores have become key actors in larger digital ecosystems (Goggin, 2021). More precisely, Apple operates a "platform ecosystem", or "an assemblage of networked platforms, governed by a particular set of mechanisms", which collectively "shape everyday practices" (van Dijck et al., 2018, p. 4). In such platform ecosystems, mobile phones have become increasingly important, if not vital, for globally operating platform conglomerates. All the major platform companies – the US-based Google, Apple, Facebook, Amazon and Microsoft, and the China-based Baidu, Alibaba and Tencent – have become crucial institutional actors in mobile platform ecosystems. Together, they own and operate essential infrastructural platform services, which are not so much popular apps but mobile devices, mobile operating systems, app stores and app development tools and associated documentation (van Dijck et al., 2019). That is to say, these infrastructural services are the critical nodes "through which data flows are managed, processed, stored, and channeled, and upon which many other online services, complementors, and users have come to depend" (van Dijck et al., 2019, p. 9). For example, key nodes in Google's ecosystem are its Pixel phone, which runs the Android operating system that features the Google Play Store to download apps, and Android Studio for app developers to build new applications. Thus, these 'nodes' are deemed 'infrastructural' because they have become essential intermediaries for both app developers and end-users (Plantin & de Seta, 2019). Without them, app developers are unable to develop, distribute, market and/or monetize their applications. Likewise, without these nodes, end-users would be unable to find their routes, order food, pay or share their TikTok videos.

Interdisciplinary app studies

Because apps have turned into mundane software, every industry actor or societal sector is implicated in the app economy, from transportation (e.g. Uber, DiDi and Lyft) to health care and wellness (Strava and COVID-19 tracking apps), and from connectivity (WhatsApp, Line and WeChat) to entertainment (Netflix, YouTube and Subway Surfers). As a result, the politics of app production, or, as critical media studies scholars would say, the political economy of the app ecosystem, is slowly but steadily becoming a key scholarly concern. Three fields of study include the politics of apps in their research agendas: platform studies, business studies and critical political economy of communications.

First, there is a subset of media and communication scholars doing work under the guise of software studies, platform studies and, most recently, app studies (Bucher, 2018; Gerlitz et al., 2019a; Montfort & Bogost, 2009). Here, we find work that includes research on platform and app governance (Duguay et al., 2020), app and platform infrastructures (Gerlitz et al., 2019b) and digital methods to analyze institutional relationships in app ecosystems (Dieter et al., 2019). Second, there are two economic approaches that study how platform ecosystems function as markets. On the one hand, there is scholarship at the intersection of strategic management and information systems research (Ghazawneh & Henfridsson, 2013; Rietveld et al., 2020), which is concerned with how mobile platforms open their boundaries to app developers, while maintaining control over their business model and content distribution. On the other hand, critical political economists and critical media scholars have raised concerns about the stark socioeconomic inequalities and power asymmetries in terms of which developers are able to access app ecosystems and under what conditions (Nieborg et al., 2020; O'Meara, 2019). Increasingly, these two economic approaches – both mainstream (orthodox) and critical (heterodox) – are converging as there is a growing concern about the implications of the

strong winner-take-all effects that are a hallmark of platform and app markets (Poell et al., 2021).

In sum, these fields are primarily concerned with economics, business models, infrastructures and governance frameworks by putting institutional relationships among businesses, individual entrepreneurs (e.g. 'creators' or 'influencers') and governments front and center. As such, less attention is paid to the cultural practices and identities of users, either in their role as consumers or citizens. For such work, one would turn to the field of mobile media studies, which can be found in journals such as *Mobile Media & Communication*.

Because of the scope and scale of the app economy, our inventory of scholarship on the politics of apps is far from complete. For instance, mobile apps are at the heart of the 'gig economy', particularly ride hailing and food delivery (Rosenblat, 2018). A key concern of this line of research is how platform companies such as Uber, Deliveroo and DoorDash instantiate new forms of labor. Individual case studies – for example, a study of the China-based transportation platform company DiDi Chuxing – are sensitive to the role of the state and the specific historical context in which these services emerge and evolve (Chen & Qiu, 2019). Others point to the increased precarity of platform labor (van Doorn, 2017) or how cultural production becomes increasingly platform-dependent and app-dependent (Poell et al., 2021). These interventions bring us back to the key questions germane to app politics: the infrastructural and economic relationships between platforms and apps as well as app stores and app developers, and how these relationships differ across industry segments and regions.

Locating apps

Apps, as noted by mobile media scholar Gerard Goggin (2021), are "obvious, but tricky to pin down" (Goggin, 2021, p. 15). When researching apps, one of the immediate methodological challenges that scholars are faced with is how to bracket one's object of analysis.

First, there is the recognition that apps are part of multilayered infrastructures (van der Vlist & Helmond, 2021). Similar to the recognition of the Web as layered – consisting of web elements, web pages, websites and web spheres (Brügger, 2018) – software scholars Carolin Gerlitz and her colleagues (2019a) break down the 'app/infrastructure stack' into six units of analysis: the physical level, the system level, object code and program execution, networks, the app (store) package and in-app services. Such a material perspective highlights the importance of taking the embedded and relational dimension of app infrastructures into account. What this means in very practical terms is that, compared to an Android app running on a Huawei phone, the iOS version of that very same app running on an iPhone not only looks different but the app will also have different affordances. One way to account for the infrastructural differences in an app's 'environment of expected use' would be to use the 'walkthrough method', which is sensitive to the app's vision, operating model and modes of governance, which differ across mobile ecosystems (Light et al., 2018).

Second, not all apps are created equal. All apps, though, tend to extend far beyond their own infrastructural and computational boundaries. On the one hand, there are thousands of apps that have one straightforward purpose or functionality. Think of a flashlight app or calculator app. Even then, such applications are integrated with other levels in the app/infrastructure stack that are not instantly visible to users. For example, to enable digital advertising, seemingly simple apps are likely to have Google's or Facebook's software development kits (SDKs) integrated in their code. This, in turn, supports Google and Facebook to use apps to capture "user data well outside the discrete boundaries" of their respective platforms (Blanke & Pybus, 2020, p. 3). This dynamic of centralized data capture by platforms via decentralized technological integrations in apps has been theorized as 'platformization' (Helmond, 2015), which, spurred by advertising-driven platform companies, has rapidly become one of the key organizing principles constituting the app ecosystem (Nieborg & Helmond, 2019). On the other hand, this complex web of infrastructural integrations cannot be untangled from the economic relationships among institutional actors active on mobile ecosystems. For example, the world's most downloaded and used apps – for example, Facebook Messenger, WeChat, Line – have turned into 'super apps' that provide a myriad of services *within* the boundaries of their apps (Goggin, 2021; Steinberg, 2020). WeChat, owned and operated by the China-based tech conglomerate Tencent, stands out. Over the last decade, it grew into a mega-platform by integrating third-party products and services – from payments to transportation to entertainment – via easily accessible in-app applets known as 'Mini Programs' (Chen et al., 2019). The arrival of super apps further blurs the economic and infrastructural boundaries of individual app instances.

App stores and the app economy

No investigation into the politics of apps is complete without acknowledging the role of app stores as the primary and native environments for the distribution and monetization of mobile apps (Gerlitz et al., 2019b). In most countries, with the notable exception of China, the app stores owned and operated by Apple and Google are likely to be the primary gateway to download new apps on one's device. For developers, this means that they are fully reliant on the strategic orientation of these two companies. Together, they have opened their platform boundaries to allow third-party developers to build complementary innovations (Gawer, 2021). At the same time, platform providers have an incentive, and in some cases a legal obligation, to protect users from harm. Platform boundaries may need to be opened up to allow for external contributions, but this instantly prompts concerns about whether or not economic transactions run smoothly, privacy is guaranteed or apps simply function well. That is, app store owners and operators constantly oscillate between resourcing developers and securing platform boundaries (Eaton et al., 2015).

The notion of 'generativity' is often used to point to the cultural and economic benefits of having a broad pool of developers creating unforeseen products and services (Zittrain, 2008). With its integrated, closed-off mobile ecosystem, Apple provides "sterile *appliances* tethered to a network of control" (Zittrain, 2008, p. 3; emphasis in original). While Apple's App Store hosts many thousands of apps, it consistently declines, rejects or bans many more. Unlike the PC, which because of its open architecture is the very hallmark of generativity, Apple fully controls app distribution. Studies on app store governance point to the impact of such strict control (Hestres, 2013; Gillespie, 2018). Apple's guidelines are deemed uneven, untransparent and ambiguous by app developers (Bergvall-Kåreborn & Howcroft, 2013). Its anonymous army of app store curators routinely rejects apps they deem not 'family friendly', or they hide behind subjective arguments stating that an app does add value to its store.

A promising line of research that analyzes the tensions between app store operators and app developers considers the role of so-called 'boundary resources' (Ghazawneh & Henfridsson, 2013). App store operators provide such resources to developers by granting access to data infrastructures and system functionalities such as SDKs, integrated development environments (IDEs) and application programming interfaces (APIs). To make sure these infrastructural gateways are legible to developers, app store operators also host developer conferences and offer a wealth of documentation, which includes community guidelines, terms of service and developer videos and guides.

As app stores constitute prototypical two-sided markets – with users on the demand side and app developers on the supply side – they are subject to direct network effects that dictate that an increase in usage increases the value of a product or service. These effects are particularly pronounced in digital markets and when platforms provide networked services. For example, the more users adopting a messaging app, the more valuable that app becomes to other users. One of the results of strong network effects has been that app store indicators – for example, the number of downloads, app revenue and ultimately profit – are distributed unevenly (Bresnahan et al., 2015). Put in stark economic terms, while for app developers the barriers to market entry are relatively low, demand is highly concentrated. As of yet, effective instruments to redistribute attention or to engage in selective promotion to ensure greater diversity in app consumption have not materialized (Rietveld et al., 2020). In some industries, such as gaming, this allowed incumbents and those who found early success to solidify their already dominant positions (Nieborg et al., 2020). For now, the app economy remains a winner-take-all market par excellence.

Future perspectives

While apps may be imagined narrowly as discrete media objects, there is an increasing awareness that they are relational objects, functioning within broader data and platform ecosystems that are contingent on the politics and structures of platforms and third-party services. To grasp the intricacies of such a myriad of economic, infrastructural and governmental dependencies, an interdisciplinary approach is warranted. For instance, platforms are investigated as modular codebases for software development in information systems literature, as multisided markets in strategic management and as non-neutral intermediaries in media studies. Such work could take on questions about the geopolitics of app distribution vis-à-vis more regional case studies of app ecosystems (Steinberg, 2020). Combining such insights would situate app ecosystems – the complex constellation of platforms, app developers, app stores and users – in their historical, cultural, social, economic and political context.

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Related entries

Algorithm, machine learning and artificial intelligence; Data doxa; Digital surveillance; Gamification in politics; Microtargeting; Platform labor and digital labor; Social media analytics companies

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