

Uber-production: From global networks to digital platforms

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journals.sagepub.com/home/epn**Gernot Grabher and Erwin van Tuijl**Urban and Regional Economics, HafenCity University Hamburg,
Germany**Abstract**

Uber and Airbnb have advanced into emblematic cases in debates in which the new digital capitalism is framed in terms of the so-called sharing economy. While this strand of inquiry has produced a wealth of insights into the workings and impacts of peer-to-peer platforms, the digital transformation of business-to-business interactions has so far attracted less attention. The present Exchange confronts this challenge by juxtaposing platform conceptions with a pre-eminent framework to conceptualize business-to-business relations: global production networks (GPN). Specifically, this Exchange addresses challenges posed by the platform approach for the GPN framework in the four dimensions: value (from owning assets to granting access), governance (from make-or-buy to employ-or-enable), management (from back-end to front-end) and labour (from jobs to gigs).

Keywords

Digital platforms, global production networks, multisided markets, innovation ecosystems

From Nikefication to Uberisation

Disruption is the new black. The usual lexicon of transformation and change, in fact, no longer seems sufficient for proclaiming the current revolutionary breakthrough in capitalist development. Aspiring to innovation beyond established trajectories and market constellations, disruption aims at the displacement of established markets, firms and products (Christensen et al., 2015). The Silicon Valley mantra ‘move fast and break things’ (Mark Zuckerberg, CEO of Facebook) captures the spirit of disruption, and the model of the platform provides the vehicle for deranging the established economic order (Kenney and Zysman, 2020). And in fact, within a few years, the platform has evolved into an emblem

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and embodiment of the new digital capitalism (Kenney et al., 2019; Langley and Leyshon, 2017a; Parker et al., 2016; Srnicek, 2016).

With this indicative quality, the *platform* signifies the latest stage of capitalist development that took off with the breakthrough of the factory system (Grabher and König, 2020). By superseding the notoriously unreliable *putting-out* system (Lazerson, 1995), the *factory* unleashed the economic dynamics of industrialisation: Prometheus had been unbound (Landes, 1969; see also Polanyi, 1945). The emergence of the *corporation* precipitated a thoroughgoing rationalisation and ushered in the phase of organisational modernisation (Chandler, 1977; Schumpeter, 1942). By expanding from the solitary entity towards federated ensembles, *networks* – conceptualised as either global commodity chains (Gereffi, 1996) or global production networks (GPN; Henderson et al., 2002) – eventually came to shape globalisation.

The current amalgamation of globalisation and digitalisation, propelled by a shift from networks to platforms or, phrased differently, from ‘Nikefication’ to ‘Uberisation’ (Davis, 2016a, 2016b), has also started to attract attention in economic geography (Langley and Leyshon, 2017b). The engagement with the, as some argue, already maturing platform economy (Kenney et al., 2019) in our field, so far, has primarily been focused on peer-to-peer (P2P) and business-to-consumer (B2C) platforms in the domains of accommodation (e.g. Ferreri and Sanyal, 2018; Stabrowski, 2017; Wachsmuth and Weisler, 2018), transport (Attoh et al., 2019; Braun et al., 2016) and digital labour (Graham et al., 2017; Wood et al., 2019; Woodcock and Graham, 2019). The emergence of platforms in the realm of business-to-business (B2B) transactions, in contrast, thus far has hardly been examined in economic geography in a systematic fashion (for important exceptions, see Langley and Leyshon 2017a, 2017b).

This Exchange seeks to address this gap by juxtaposing platform conceptions with the theoretical framework that plays a pre-eminent role in the economic geographic reasoning on B2B relations: GPN (Coe and Yeung, 2019; Henderson et al., 2002; Humphrey, 2019; Yeung and Coe, 2015). This confrontation is motivated by heuristic considerations: the present juxtaposition of ‘ideal types’ (Weber, 1968: 191) is emphatically partial. Rather than producing granular descriptions, this analytical strategy is aimed at elucidating criteria for categorical distinction and at identifying promising corridors for future research. We are keenly aware that this analytical strategy impossibly can do justice to the wealth and ramifications of both bodies of research.¹ However, we believe that it is worthwhile to assume the risks associated with construing dichotomies – if heuristic surplus can realistically be expected.

More specifically, we shall identify key conceptual challenges posed by the emergence of platforms by confronting the GPN approach with pertinent theoretical contributions in economics and business studies (Cusumano, 2019; Gawer and Cusumano, 2002; Kirchner and Schübler, 2020; Parker et al., 2016; Rochet and Tirole, 2003; Shipilov and Gawer, 2020), sociology (Arcidiacono et al., 2018; Watkins and Stark, 2018; Wood et al., 2019), social media studies (Gillespie, 2010; 2018; Plantin and Punathambekar, 2019; van Dijck et al., 2018; Zuboff, 2019) and economic geography (Davies et al., 2017; Frenken, 2017; Grabher and König 2020; Graham et al., 2017; Langley and Leyshon, 2017a, 2017b; Stabrowski 2017).

We proceed as follows. First, we briefly synthesise key advancements in the theoretical framing of platforms, preliminarily conceived as digital infrastructures for economic transactions among different groups. Subsequently, we juxtapose this framing of platforms with the GPN approach by, in turn, addressing the key challenges in the four dimensions that are also pertinent in the GPN literature: value, governance, management and labour. Finally, we elucidate the potential as well as the limitations of the platform concept to

frame conceptually and to explore empirically the emerging modes of economic organisation and transaction in the B2B realm.

Making sense of platforms: matchmaking and ecosystems

The prevailing conceptualisations of platforms echo the distinctive concerns of the respective disciplinary traditions. In economics, platforms are primarily conceptualised as *multi-sided markets* (Rochet and Tirole, 2003). Multisided markets are anything but novel, but in fact designate the interface configuration of businesses such as credit cards, for example, in which the credit card provider affords an interface between the market of consumers (who use the card) and the market of companies (who accept the card as payment device; Hagiu and Wright, 2015). Platforms in this perspective operate as ‘match-makers’ (Evans and Schmalensee, 2016) between previously fragmented and unconnected groups of users. In the course of pervasive digitalisation, platforms have fundamentally transformed domains as diverse as the markets for goods (e.g. Amazon, eBay), mobility (e.g. Uber, Lyft), labour (e.g. Upwork, TaskRabbit), funding (e.g. Kickstarter, Prosper) (Evans and Gawer, 2016; Langley and Leyshon, 2017b) and, of course, the entire field of online search, socialising and content production (e.g. Facebook, Google, YouTube) (van Dijck et al., 2018; Zuboff, 2019).

In business studies, platforms have primarily been perceived as *ecosystems* that encompass a group of interdependent actors that jointly develop a set of complementary assets (Cusumano et al., 2019; Gawer and Cusumano, 2002, 2014; Jacobides et al., 2018). A prime example in the B2C realm is Apple’s ecosystem in which Apple (the platform operator), software developers and individuals (platform users) jointly use and co-develop complementary software and hardware products (Teece, 2018). Amongst the pioneering ecosystems in the field of B2B are the Bosch IoT-Suite, General Electric (GE) Predix, IBM Watson, Microsoft Azure, SAP Leonardo and Siemens Mindsphere which are aimed at enhancing the efficiency and reliability of industrial processes (Butollo, 2019: 10; Cusumano et al., 2019; Menon et al., 2019). The quintessential feature of ecosystems, complementarity (Kapoor, 2018: 7–8; Rietveld et al., 2019), implies that an increase in the demand for product A (e.g. smartphones or sensors) leads to an increased demand for product B (e.g. apps or manufacturing software). Complementarity, then, holds the promise that a contribution to an ecosystem reaps higher value (and generates more profit) than trading the same product outside the platform (Lan et al., 2019).

In the blurred economic reality of diversified multi-platform companies, the role of the match-maker and of the ecosystem orchestrator frequently interpenetrate each other (Butollo, 2019: 12–15; Jacobides et al., 2018: 6–9; Shipilov and Gawer 2020: 96). More importantly, despite these two different logics, platform operators embody the same two principles of platform economies. First, platform operators, regardless of whether match-maker or ecosystem orchestrator, seek to leverage the single most powerful escalating platform dynamics. Once platforms ‘reach a critical inflection point, *network effects* kick in and growth follows an exponential trajectory’ (Hagiu and Rothman, 2016: 2; own emphasis). The more users a platform operator can attract onto its demand side, the more users will be drawn to the supply side, which subsequently turns the platform into an even more lucrative option for demand-side users, and so on (Rochet and Tirole, 2003): the ‘winner takes all’ logic of platforms (Parker et al., 2016).

Second, and despite contrary corporate assertions, platform operators act as *non-neutral intermediaries* between different groups of users (Evans and Schmalensee, 2016; Gillespie, 2018). Rather than simply providing a neutral interface as match-makers,

platform operators in fact act as market-makers (Grabher and König, 2020; Kirchner and Schübler, 2020) by deploying various business practices. Instead of displaying prices established through demand-and-supply coordination in a passive fashion, platform operators actively forge price regimes (Parker et al., 2016). In order to get both sides of a platform on board at the same time, operators pursue cross-subsidising strategies (Rochet and Tirole, 2003: 990) by charging a higher fee for one side of the platform (i.e. the ‘profit maker’) while subsidising participation on the other side (i.e. the ‘loss leader’). Moreover, through both explicit and codified Terms of Service (ToS) as well as through less visible black-boxed algorithmic governance, platform operators define and police quality standards and platform participation (Cheney-Lippold, 2017; Zuboff, 2019). Through end-to-end algorithmic monitoring as well as pervasive rating systems, platforms afford an ‘evaluative infrastructure’ (Kornberger et al., 2017). Every transaction feeds into the online reputation that determines the corridors of platform participation, ranging from user stratification (e.g. Airbnb ‘Superhosts’) to complete debarment from participation (e.g. of Uber drivers whose rating consistently falls short of a predefined minimum threshold of star ratings) (Attoh et al., 2019).²

In an attempt to synthesise the pertinent debate on features and models, we extend our preliminary understanding and define platforms as programmable digital infrastructures controlled by platform operators who, as non-neutral intermediaries, curate the interactions of interdependent complementors and users (Gillespie, 2018; van Dijck et al., 2018; Plantin and Punathambekar, 2019). An infrastructural angle affords a particularly instructive heuristic since it foregrounds power relations and the contingent and relational nature of platforms (Plantin and Punathambekar, 2019: 166) as well as the indispensable, though typically invisible, role of maintenance for reliable performance (Leigh Star, 1999).

In the next section, we seek to identify key challenges that the proliferation of platforms poses for the conceptualisation of economic organisation and transaction as GPN. Again, we would like to stress that our juxtaposition of ‘ideal types’ (Weber, 1968) unavoidably glances over the diversity within the broad spectrum of empirical manifestations of GPN (Grabs and Ponte 2019; Yeung, 2016) as well as of platforms (Cusumano et al., 2019; Srnicek 2016).

Challenging the GPN approach: the transformation of value, governance, management and labour

Value: from owning assets to granting access

GPN seek to create value across all stages of the value chain, ranging from raw material extraction over manufacturing and marketing products (Gibson and Warren, 2016; Henderson et al., 2002; Yeung and Coe, 2015). Value in GPN, then, is derived from production and supply-side economies and based on the ownership of strategic assets that are essential for leveraging those production economies. More specifically, value is calculated with the standard metrics that assess the worth of tangible assets such as production facilities and human capital or intangible assets such as extraction rights and intellectual property (Van Alstyne et al., 2016: 5). Platforms, of course, are not devoid of tangible assets. On the contrary, Airbnb relies on the availability of housing stock; Uber is dependent on an available fleet of vehicles; the business prospects of Siemens Mindsphere and GE Predix hinge on access to the manufacturing equipment at the their clients. The value of platforms, crucially however, is not based on the ownership of these particular tangible assets but, quite

diametrically opposed, on the ability to evade ownership and the respective responsibilities of owning assets (Davis, 2016b).³

Despite considerable diversity, GPN typically connect ‘asset-heavy’ firms, whereas the ‘asset-light’ company is the epitome of platforms (Parker et al., 2016: 68–70). While the globally leading hotel group, Marriott International (176,000 employees), for example, owns 6906 properties with approximately 1.3 million guest rooms (Marriott Inc., 2018), the hospitality platform operator Airbnb (12,000 employees) does not own a single hotel room and yet enabled 115 million stays in more than seven million listings at the end of 2017 (Trefis Team, 2018). Rather than on the supply-side economies of owning assets, the value of platforms is based on demand-side economies of granting access. The metrics of valuation, indeed, shift from control over assets to the orchestration of crowds, from the ability of managing resources to the creativity in managing relationships (Van Alstyne and Parker, 2017: 26).⁴ GPN, then, resonate with the resource logic of ‘making things’ (with assets), while platforms leverage the network effects of ‘making matches’ (within a crowd).

Governance: from make-or-buy to employ-or-enable

Governance in the GPN approach is fundamentally framed in the relational terms of networks, firmly located between the poles of markets and hierarchies (Henderson et al., 2002; Yeung and Coe, 2015). The platform, in contrast, amalgamates market and hierarchy into a new hybrid (McIntyre and Srinivasan, 2017; Sundararajan, 2016) that blends the ‘visible hand’ of corporate hierarchy with the ‘invisible hand’ of the market into a ‘translucent hand’ (Altman et al., 2019) that orchestrates rather than commands communities of platform users. Platforms, phrased differently, imply a shift from ‘dictating processes’ to ‘persuading participants’ (Van Alstyne et al., 2016: 5), from hierarchical instructions to economic incentives. In contrast to the hierarchically controlling lead firms in GPN, platform operators face the arduous challenge to suspend some control over resources in order to leverage the motivation of complementors to contribute to the ecosystem (Watkins and Stark, 2018). As the case of GE Predix illustrates, the suspension of control proves particularly challenging for companies that seek to transform themselves from a GPN lead firm into platform operator: ‘The natural tendency for an established giant such as GE was to control everything. Yet building a successful platform was about enabling others, and not control. GE initially fell into this trap... GE had reversed course: It abandoned its own cloud infrastructure in favor of running Predix on top of Amazon’s AWS and Microsoft’s Azure Cloud’ (Cusumano et al., 2019: 163).

The governance of platforms hence requests a heedful navigation between, on the one hand, too strict control (that weakens incentives for complementors to contribute) and, on the other hand, too little control (that entices power asymmetries and conflicts between complementors; Saadatmand et al., 2019: 4). Volkswagen (VW), for instance, assigns Siemens Mindsphere a crucial operative role in the VW Industrial Cloud (that enhances interconnectivity of manufacturing equipment), but at the same time, VW is adamant not to relinquish overall platform control to Siemens (Butollo, 2019: 14). Platform operators, then, have to ‘craft rules and shape the ecosystem development to tie in complements and make complementors abide to them’ (Jacobides et al., 2018: 2263). Moreover, instead of concealing strategic knowledge, protecting intellectual property (through patents) and caching data, platform operators are also pressurised to share critical knowledge as well as vital data (Altman et al., 2019).⁵ The relative openness in knowledge governance, evidently, is not an expression of a deliberately democratic mode of control (see, e.g., von Hippel, 2005), but

rather a manifestation of an inexorable business imperative of the platform model (Schmeiss et al., 2019).

Shifting from GPN to platform also implies a move from the classical ‘make-or-buy’ calculation to an ‘employ-or-enable’ assessment. Whereas GPN lead firms in a make-or-buy framework usually have direct contractual relationships with transaction partners, platform operators confronting the employ-or-enable decision enable contractual relationships with transaction partners without being a (legally accountable) party themselves (Hagiu and Wright, 2015). Platform users, then, are affiliated with rather than contracted to the platform (Hagiu and Wright, 2015) and, due to the low switching costs, can participate in various platforms at the same time. Through the ensuing practice of ‘multi-homing’ (Rochet and Tirole, 2003: 993), independent complementors thus generate interdependencies within increasingly complex ‘ecologies of platforms’ (Hilbolling et al., 2019: 27).

Management: from back-end to front-end

Whereas management in the GPN approach is based on ownership of strategic assets (Coe et al., 2004; Humphrey, 2019), the key concern of management of platforms is the orchestration of complementors (Van Alstyne and Parker, 2017). The focus, phrased differently, shifts from the organisation of internal resources and the optimisation of the supply chain to the management of external resources (Shipilov and Gawer, 2020). The managerial challenge of moving from ‘making things’ to ‘making matches’ involves no less than a reconfiguration of the business organisation from reaping supply-side economies of scale through production efficiencies to leveraging demand-side economies of market aggregation (Van Alstyne et al., 2016: 5).

In terms of operations management, this reorientation also entails a recalibration of managerial priorities and organisational hierarchies. Whereas in the context of a GPN, back-office operations such as enterprise resource management are of strategic importance, platform operators attach higher significance to front-office operations and customer relationship management (Parker et al., 2016). Moreover, the key imperative in the design of critical digital infrastructures and information systems is no longer confined to smooth transactions within the production network. Rather, information systems in platforms have to assure interoperability between complementors through a standardised interface (i.e. API, Application Programming Interface) (Jacobides et al., 2018). In the realm of B2B, interoperability is a particularly daunting challenge, since corporate platform users symptomatically operate with rather idiosyncratic, densely layered ‘legacy systems’ (Agarwal and Brem, 2015: 205; Saadatmand et al., 2019). Finally, the management of transactive infrastructures in GPN traditionally was concerned with providing efficient (physical) logistics for shipping goods and distributing services. In line with their ‘asset-light’ business model, platform operators shift the responsibility for physical logistics onto the users and, instead, primarily rely on the (digital) infrastructure of cloud computing, big data and algorithmic control (Kenney and Zysman, 2016).⁶ These digital infrastructures, hence, have turned into a strategic asset of platforms in their own right (McAfee and Brynjolfsson, 2017: 137–138; Plantin and Punathambekar, 2019).

Labour: from jobs to gigs

The juxtaposition between ‘asset-heavy’ GPN firms and ‘asset-light’ platform operators is presumably most starkly evinced in the politically charged debates on the status of the asset labour (Frenken et al., 2018; Kirchner and Schüßler, 2020). Whereas the production logic of

GPN implies that labour is employed and, at least in the controlling echelons of the network, is regarded as a critical asset (Coe and Yeung, 2019), the very essence of the match-making logic of platforms is to refuse contracted labour the status of employees (Frenken et al., 2018). Platform operators insist in the role of the neutral intermediary that solely matches the supply of and demand for independent contractors (Graham et al., 2017). By emphatically maintaining this claim (through a multitude of litigation cases across a multitude of jurisdictions),⁷ platform operators seek to avoid basic entitlements resulting from employment contracts such as social security, minimum wages as well as work time and security regulations. The fervour of the legal disputes over the status of labour as well as the clash between the lobbying campaigns of platform operators (see, e.g., Rauch and Schleicher, 2015), on the one hand, and initiatives to organise and protect labour (Johnston and Land-Kazlauskas, 2018; Katta et al., 2020), on the other, reveal the centrality of this constituent of the platform model: the categorical distinction between protected employee and independent contractor is also stylised as the threshold between deepening losses and (prospects of) future profits (De Ruyter and Brown, 2019).

In terms of labour market governance, GPN materialise as hierarchical global layering of the factory system (with a spatially concentrated labour force), whereas platforms rather resemble a global archipelago of putting-out systems (with a spatially dispersed labour force; see also Kenney and Zysman, 2016: 62, 2020). In terms of employment regimes, platforms accelerate the ‘vanishing of the corporation’ (Davis, 2016a) and expedite the secular shift from (long-term) employment relations over (short-term) jobs to (discrete) gigs (Davis 2016b; Kenney and Zysman, 2019). This ‘taskification’ of work (Sundararajan, 2016: 173) transforms professional careers governed by (offline) accumulated human capital into contractual portfolios shaped by (online) reputation capital (Grabher and König 2017; see also Neff, 2012). With regard to labour, platforms, then, in fact achieve the ‘disruption’ they are celebrated for.

Conclusion: recalibrating governance

As emblem and embodiment of the new digital capitalism, the emergence of platforms has indeed incited a sweeping transformation of the governance, organisation and regulation of the economy (Kirchner and Schüßler, 2020; Montalban et al., 2019; Parker et al., 2016; Srnicek, 2016). The platform might even be placed in the succession of transformative stages of modern capitalism taking off with the breakthrough of the factory (Landes, 1969) to the rise of the corporation (Chandler, 1977) and the proliferation of (global production) networks (Henderson et al., 2002).

This Exchange set out to identify conceptual challenges that the proliferation of platforms posed for the conceptualisation of GPN. By juxtaposing key tenets of the GPN literature with initial robust insights from platform research, we elucidated changes catalysed by the advent of platforms, in particular in the dimensions of value, governance, management and labour. With this preliminary assessment we of course do *not* intend to insinuate a substitution of the GPN framework by a platform approach. Rather, we are interested in directing attention to dimensions in which we suspect a morphing of GPN within various arenas of consolidation and combination as well of critical lines of friction and conflict with platform models (Butollo, 2019; Humphery, 2018; Shipilov and Gawer, 2020).

On a more general level, we propose to advance a recalibration of key governance mechanisms (Kapoor, 2018). Whereas the GPN approach championed the pre-eminent role of networks, platforms invite a re-appreciation of markets. Our suggestion, however,

is not aimed at a (re)engagement with classical (one-sided) markets as one of us has suggested against the background of the ‘projectification’ of organisation in the more recent past (Grabher, 2004). Instead, we propose, on the one hand, to explore the relevance and limitations of the model of multisided markets further (Hagiu and Wright, 2015; Parker et al., 2016) for the economic geographic theorising of the B2B realm. Pertinent debates in our field so far have primarily focused on transformations in the P2P and B2C domains of the so-called sharing economy (e.g. Attoh et al., 2019; Ferreri and Sanyal, 2018; Stabrowski, 2017; Wood et al., 2019). On the other hand, we would suggest to advance beyond an economic reasoning on markets (regardless of whether one- or multisided) and to explore and conceptualise further how platform operators are not simply match-makers but instead veritable market-makers. As market-makers, platform operators not only enable individual transactions but actually frame the entire institutional and regulatory framework of the platform economy (Frenken et al., 2018; Kirchner and Schübler, 2020). In Polanyian (1945) terms, platform operators, then, co-produce their own institutional and societal embeddedness (Grabher and König 2020).

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Notes

1. The differentiation between GPN 1.0 and GPN 2.0 (Yeung and Coe, 2015) is but one indication of the differentiations within this wide-ranging strand of inquiry.
2. Facebook, of course, is a central arbiter of online reputation and in fact acts as a ‘central bank for social capital’ (Schwarz, 2019). Performing the role of a central bank, Facebook can charge commissions, block currency transfer (converting online reputation across different platforms) and confiscate social capital (through exclusion from platform participation).
3. How much valuation is dependent on the ability of platform operators to avoid accountability for assets has been demonstrated by the spectacularly failed IPO of WeWork that has been dubbed as a sort of Airbnb for office space. In contrast to Airbnb, however, WeWork had entered contractual commitments over tangible assets (office buildings). The extent of these long-term obligations revealed in the IPO prospectus elicited fundamental scepticism on the viability of this asset-heavy business model and, together with other concerns, sent the market capitalisation from \$104 billion (in August 2019 by Morgan Stanley) to a sobering \$8 billion in February 2020 (Platt and Edgecliffe-Johnson, 2020).
4. The crowd of platform users, of course, not only provides supply of and demand for goods and services, but also produces data that can be transformed into tradeable commodities (Crain, 2018; Butollo, 2019: 7; Grabher and König, 2020: 12–14).
5. The spectrum of sharing arrangements with regard to data ranges from GE, which grants users the right to retain ownership of their data processed on the Predix platform (Cusumano et al., 2019: 165), to Microsoft’s Azure and IBM’s Watson, which preclude complementors from aggregating user data (Menon et al., 2019: 16).

6. We are, of course, aware that the cloud and ‘software-as-a-service’ have also become indispensable for the management of GPN (as, in fact, for any business venture). We rather would like to accentuate the relative importance of the physical and digital infrastructures within GPN and platforms respectively.
7. A key arena for legal disputes over the status of so-called gig workers in the platform economy is the USA. Whereas, for example, the US Labor Department on 29 April 2019 created a precedent by ruling that an indicted platform operator is not obliged to offer federal minimum wages or social security (Scheiber, 2019), California legislators on 11 September 2019 passed a landmark bill under which workers are likely to be employees if the company directs their tasks and the respective work is part of the company’s main business (Conger and Scheiber, 2019).

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