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The Role of Marketing in Digital Business Platforms

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Abstract

Digital business platforms (DBPs) such as eBay, Google, and Uber Technologies have seen enormous growth; this paper explores their salient characteristics, the role of marketing in helping DBPs succeed, and important research topics for theory and practice. A new conceptual framework based on insights from transaction cost analysis outlines the role and impact of marketing in DBPs. A key role for marketing is to increase the number and quality of interactions on a DBP while reducing transaction costs for users and production costs for the DPB. The DBPs' interactions and the data thus generated are key enablers of value creation and value appropriation on these platforms. However, there are several challenges to resolve in value creation and value appropriation because DBPs cater to the needs of many different types of users. Therefore, DBPs should carefully coordinate and manage interactions among users on different sides of a platform. For researchers, there are many opportunities to reconceptualize some of the traditional roles of marketing in the context of DBPs.

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Keywords: Digital platforms; Digital marketing; Business model

Introduction

Major transformations are underway in how businesses are being architected for success in today's economy. Traditional pipeline businesses are giving way to platforms (Van Alstyne, Parker, & Choudary, 2016). A pipeline business (traditional companies such as IBM, General Electric Company, or Procter

& Gamble) is designed to succeed in an economic system that comprises linear value chains, in which companies purchase inputs from others; transform those inputs into value-added solutions through manufacturing, assembly, or branding; then use marketing channels to reach customers with their offerings (we use “offerings” as a higher-level category to represent both goods and services), leaking minimum value to other members in the value chain (Porter, 1985). In contrast, a platform business is an entity that “brings together individuals and organizations so they can innovate or interact in ways not otherwise possible, with potential for nonlinear increases in utility and value” (Cusumano, Gawer, & Yoffie, 2019, p. 13).

We focus on digital business platforms (DBPs), which are designed expressly to use digital technologies to enable

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business interactions among authorized users.² For example, Nasdaq, Google, Uber Technologies, PayPal Holdings, and eBay are DBPs with two or more “sides,” in which each side consists of one type of entity (e.g., suppliers with different offerings on one side, potential customers on the other). The platform functions as a virtual marketplace connecting these parties so they can interact and complete transactions. The Amazon marketplace is a DBP consisting of 1.9 million independent suppliers (i.e., affiliates) catering to over 100 million Amazon Prime customers in addition to non-Prime customers (The Economist, 2019).

Our objectives are to: (1) define DBPs and highlight their important characteristics; (2) describe the opportunities and challenges associated with DBPs, especially, as they relate to marketing; and (3) propose areas for further academic research on DBPs to address theoretical, empirical, and managerial issues of interest to marketing scholars. Although an extensive literature investigates platforms in general, as well as some recent work devoted to DBPs (e.g., Choi & Mela, 2019; Sun, Zhang, & Zhu, 2019), few studies elucidate the roles of marketing in DBPs (or, more generally, in platform businesses). We propose a new conceptual framework based on transaction cost analysis (TCA) to articulate how marketing can contribute to value creation and value appropriation in DBPs. Our emphasis is on strategic, managerial, and economic aspects of DBPs. Although the behavioral and social elements related to DBPs are important, they are outside of our research scope.

DBPs

Delineating a DBP from Other Types of Platforms

A platform designed to enable business interactions typically provides a relatively open and participative infrastructure for the interactions that take place and sets the governance conditions to orchestrate those interactions. Its overarching purpose is to identify, create, and leverage value-creating matches among its users and facilitate the exchange of goods, services, or social currency that create value and benefit all participants by executing the exchanges (Parker, Choudary, & Van Alstyne, 2017).

Traditional business platforms typically have two sides (i.e., buyers and sellers) and function as a marketplace, but today's DBPs are often multisided; in some contexts, the same party participates on multiple sides of a platform (e.g., a person acts as a buyer and seller on eBay in different transactions). We consider a broad range of DBPs, including technology businesses such as the Apple iPhone that enable customers to transact directly with app owners, retail businesses such as Alibaba Group and Amazon Marketplace that enable users to consummate commercial transactions, and sharing economy businesses such as Airbnb and Uber. Many DBPs enable “joint enactment of interactional value creation” by different parties

on the platform (Ramaswamy & Ozcan, 2018, p. 19). As pipeline businesses add DBPs to their portfolio (Mody, Wirtz, So, Chun, & Liu, 2020), which then enable cross-boundary industry disruptions (Burgelman & Grove, 2007), marketers must understand the ongoing transformations in business architectures toward DBPs and the associated opportunities and competitive challenges.

Many business platforms do not qualify as a DBP. We use three criteria to define a DBP: (1) the core matchmaking functions (i.e., linking one user to another on the platform) are executed digitally, (2) the platform promotes direct communications and business transactions among its users, and (3) platform users are independent parties who retain residual ownership rights. There are several implications of this delineation. For example, the CES (Consumer Electronics Show) is a large trade show that brings together exhibitors or sellers and potential customers to transact directly. Top business schools facilitate value-creating matches between students and employers through career centers. We exclude such platforms because they are typically not digital. We also exclude computer technologies and systems such as Microsoft Windows, Shopify, Zoom Video Communications, Amazon Web Services, and Salesforce.com, because they play no or a minimal role in matching buyers with sellers (i.e., they are technology platforms and not business platforms).³ They constitute one-sided platforms, because the offerings come from a single entity, the platform company. Cusumano et al. (2019) refer to them as “innovation platforms” and other types of platforms, including DBPs, as “transaction platforms.” Furthermore, a casual analysis might suggest that an online grocery store is a DBP, because it brings together suppliers and consumers, caters to their heterogeneous needs, and enables consumers to match offerings with their preferences, but it is missing a key characteristic: sellers do not have residual control rights to the offerings (Hagiu & Wright, 2015). Thus, the grocery store is a reseller, not a marketplace, and not a platform. Finally, we do not consider digital collaborative platforms such as Wikipedia, GitHub, and Mozilla Firefox to be DBPs, because they do not promote business transactions. Instead, they receive support from donations and grants.

A real-world comparison might be helpful for clarifying our definition. Netflix is a technology platform, not a DBP. It is mainly a distributor of licensed content (though it produces some content), much as a grocery store is a distributor of grocery items. Content owners retain residual rights to the licensed contents, and the platform does not link a subscriber directly to a content producer. In contrast, when someone uploads content to YouTube, they grant YouTube a non-exclusive license to copy, stream, and store that content, even as they retain all residual rights. YouTube matches content with advertisers (buyers), and it pays the content providers (suppliers) an amount proportional to the advertising revenue generated. Thus, we consider YouTube a DBP that links

² Users, participants, agents, and players are different terms to denote members of a platform. We use the term “parties” when we refer to all actors, including the platform itself.

³ Microsoft Windows is a product platform for identifying and exploiting the shared logic and structure of a firm's activities and offerings to achieve leveraged growth and variety (Sawhney 1998).

content providers, advertisers, and consumers. Uber Technologies also is a DBP, because drivers retain residual rights, are independent contractors (in most jurisdictions), and are not employees of the platform, so they can choose whether and when to participate in interactions and exchanges (e.g., accept a ride request, times to offer rides).

Characteristics and Classification of DBPs

In addition to satisfying these three criteria, DBPs share many characteristics that are important for articulating the role of marketing and identifying research opportunities. We summarize the key characteristics associated with all the DBPs we considered, though they also could apply to some platforms that are not DBPs.

Stable Foundational Digital Infrastructure

The business model of a DBP relies on software, hardware, and other information technology (IT);⁴ that is, the IT systems are foundational to these business models and are not there merely to support day-to-day business operations. For example, the codebase of Google contains more than 2 billion lines (informationisbeautiful.net, 2019). Without its foundational IT infrastructure, Uber Technologies would not know where an available driver is located or how much to charge for a specific ride. The intensive use of IT enables DBPs to operate in near real time, with most online interactions completed in fractions of seconds. However, the actual exchange of value among users on the platform need not be in real time, especially when the exchange involves tangible (i.e., non-digital) products. As Constantinides, Henfridsson, and Parker (2018) have noted, it is a technical challenge to build large, stable, and ubiquitous DBPs.

Create Value for All Parties

If platform-enabled matchmaking can create value somewhere along the value chain supported by a DBP, and the DBP has reasonable rules for sharing the value generated, all parties can benefit by participating in the platform ecosystem. If one type of user gets insufficient value, such users have fewer incentives to stay with the platform, such as when suppliers switch from Amazon Marketplace to set up their own online store using Shopify (The Economist, 2019). Some value-creating activities of a DBP (e.g., promoting and facilitating exchanges, matching buyers with sellers, enabling feedback about the parties, simplified payments) are orchestrated and

managed by the platform. In contrast, other activities are left for buyers and sellers to decide (e.g., offerings exchanged, the time the exchange takes place).

Build and Leverage Network Effects

A DBP typically has built-in network effects, so the value generated by the platform for each user increases in a non-linear manner with the number of users on either side of the platform (Parker & Van Alstyne, 2005). Value increases up to a threshold, such as congestion from too many users. There are two types of network effects: direct and indirect (Wirtz, So, Mody, Liu, & Helen Chun, 2019). Direct or same-side effects refer to the utility increase for users when the number of same-side users increases. Facebook users likely value this DBP more when new members enroll. Indirect network effects pertain to the utility increase for one user group when a new user from a different group joins the platform. For example, an additional seller on eBay generates additional value for buyers through the possibility of more offerings or lower prices. Each additional buyer also increases the value of eBay for each seller.

When building a platform's network, a critical mass constraint reflects the initial condition known as the “chicken-and-egg” problem (Evans & Schmalensee, 2010). That is, “to attain a critical mass of buyers, you need a critical mass of suppliers, but to attract suppliers, you need a lot of buyers” (Hagiu & Rothman, 2016, p. 66). For DBPs dealing with intangible offerings, network scalability is often easier (e.g., low transaction costs), but scaling operations and logistics can be challenging and expensive when physical goods are involved. In some cases, network effects are local (e.g., Uber, Nextdoor, DoorDash) even though the platform is available to users outside the local area, which increases the challenges of building a strong network.

Create Thick Markets on All Sides to Improve Match Quality

Successful DBPs create “thick markets” on all sides that enable value creation through the efficient matching of supply with demand so that few, if any, users seeking exchanges are left without a suitable match. Matching buyers with suppliers or complementors can be done directly by the platform, as in centralized matching (e.g., Uber, WhatsYourPrice.com), or by the parties, and the platform enables the decentralized matching (e.g., Apartments.com, Airbnb, eBay). Centralized matching at scale is possible when a DBP has detailed data about the preferences of its users and applies sophisticated analytics. It is effective particularly if the timeliness of the response and low ex post transaction costs are critical to the exchange, as well as when user preferences reflect a few, predictable matching criteria. For example, ride sharing services are mostly matched on objective attributes related to pick-up location, time, and destination. The “quality” of all three attributes are observable and objective; a customer is likely satisfied by the matching choices made by an artificial intelligence (AI) algorithm. In decentralized matching, the platform instead provides data that enable users to connect with and evaluate the other side of a potential transaction to facilitate matching (e.g., summary

⁴ A business model is a well-specified system of interdependent structures, activities, and processes that serve as a firm's organizing logic for value creation (i.e., for customers) and value appropriation (i.e., for itself and its partners) (Sorescu, Frambach, Singh, Rangaswamy, & Bridges 2011). A business model is not the same as a business strategy. Several business models can be embedded within a single business strategy. For example, Amazon.com's strategies were to grow big fast and use data to streamline its operations. It implements these strategies using different business models such as (1) a membership model called Amazon Prime, (2) a marketplace or platform to sell affiliates' products, and (3) a personal shopper or subscription service for clothing.

reviews of hosts, pictures of properties on Airbnb) (Sutherland & Jarrahi, 2018). Decentralized matching increases transaction costs (e.g., searching, filtering, evaluation, communications among parties), though platforms can provide tools such as rating systems and recommendation agents to reduce friction. It works well when subjective user preferences or service attributes vary widely or are not clearly articulated with observable data, as well as when timeliness and transaction costs for consummating an exchange are less important to users. In such circumstances, there is less need for algorithm-based matching.

Culture of Data-Driven Decisions and Processes

As the central player in an ecosystem with many different users, DBPs have a “privileged” and “integrated” view of user data, including user preferences and activities facilitated by the platform. They can accomplish much of what they do because they gain rich, real-time data that provide deeper insights about all offers and interactions on the platform. These data are collected in the normal course of the platform's operations, and users do not incur any direct transaction costs by providing them (though there could be indirect costs). The data are integrated and processed using advanced algorithms to facilitate platform enhancements and for predicting the future platform behaviors of the users.

The privileged access to data is not available to individual users on the platform. In other words, second-party data in traditional business contexts become first-party data for a platform. A DBP can potentially use data to gain strategic, situational, or transaction-level insights; they might, for example, reduce frictions in the flow of information (e.g., providing accessible information about product and service characteristics) and communication associated with transactions. A further advantage for a DBP is that the closed loop nature of the data collection process enables the platform, its users, and its partners to run online experiments continually to improve offerings and rapidly evaluate the efficacy of potential business strategies and actions. It is difficult to duplicate these capabilities in a non-platform business model or by individual users. Such privileged access can lead to strategic manipulations that favor a DBP, as alleged by Amazon.com affiliates that accuse the firm of unfairly boosting its direct sales of an offering when it discovers that affiliate sales for that offering do well, or of misusing its position to launch private-label brands such as AmazonBasics.

Small Asset Footprint

Although DBPs attempt to operate with minimal physical assets (e.g., fewer means of production, off-balance sheet assets), they might still need fixed investments in technologies. Most sharing economy DBPs strive for growth by scaling their businesses without investing in physical assets but relying instead on peer-provided assets. To deploy their assets more effectively, some pipeline businesses are establishing digital platforms (e.g., TradeLens) (e.g., Mody et al., 2020).

Heterogenous Customer Preferences and Supplier Offerings

The DBP business model is most compelling and provides the most value for all parties when high heterogeneity exists in both supply and demand, which helps in making high-quality matches. If users on one side have similar preferences (e.g., all Airbnb units are alike, as in a hotel), there is less need for good matchmaking capability than if there is heterogeneity on all sides.

High Levels of Operational Transparency

Using their data resources, DBPs can choose to provide a higher level of transparency to the interactions that take place among users, compared with their pipeline business counterparts, which is particularly relevant in the case of service platforms. For example, a benefit for passengers using Uber in a foreign country is the predictive control they have by knowing in advance the cost, the route and duration of the trip, the quality of driver and car, and the traceability of the driver. Many attributes of an offering are transparent to users before purchase or during consumption.

Google is an important platform for marketers that satisfies all three criteria for being a DBP and also has most of the other characteristics we note. It facilitates an exchange of value among three types of users: (1) consumers searching for information, (2) advertisers trying to reach those consumers, and (3) content providers (e.g., publishers). The advertisers, or their ad agencies, are on the demand side, publishers are on the supply side, and the offering is an ad shown to a target consumer among the inventory of ad slots available on participating publishers' websites. When a consumer visits any of the publishers' websites, the Google display advertising platform attempts to match that consumer with an advertiser for whom that consumer is likely valuable, as determined by real-time bidding. Google uses several matching criteria, and the matching is completed in less than 100 milliseconds.

In traditional advertising, an ad agency attempts to reach target consumers by selecting media outlets frequented by those consumers. Google functions as an ad exchange by helping advertisers and their agencies reach target consumers without having to specify the media outlet (i.e., publisher) that the consumer patronizes, which is the unique value that the Google Ads platform offers advertisers (its customers). The buyer (the advertiser) and seller (publisher) do not directly meet, but a successful exchange is facilitated. In some cases, buyers and sellers might not even know their respective identities.

Table 1 summarizes different types of DBPs that vary in their central purpose, the types of users they support, and the factors associated with their success. Despite the different areas in which they operate, they reflect the characteristics outlined in this section. There are other ways to classify platforms: external to industry and internal to industry (Gawer & Cusumano, 2014), innovation and transaction (Cusumano et al., 2019), or according to user groups and business models (Chen, Dai, Korpeoglu, Körpeoğlu, & Sahin, 2018). In Table 1, we focus exclusively on DBPs and classify them according to their broad business functionality. We do not consider technology platforms, nor do we focus exclusively on social-sharing

Table 1
Summary of various types of DBPs.

Platform type	Examples	Suppliers (providers)	Customers	Key factors influencing success
Search/ad platform	Google, Bing, AppNexus	Content providers, publishers	Advertisers	Targetability of users, privacy
Content/ad platform (digital products, instant delivery)	YouTube, Spotify Technology (ad version), TripAdvisor, Kelley Blue Book	Content creators (e.g., writers, musicians, movie producers)	Advertisers, subscribers (visitors to the site are not customers because they do not directly generate revenue)	Curation or matching, monetization (e.g., ad targetability, subscription), privacy
Transaction platform	Amazon.com, Alibaba Group, Ping An Insurance, eBay, Craigslist, Etsy, Brasil Online (Bol)	Manufacturers, distributors, merchants (e.g., hotels, shipping companies), the platform itself	Consumers	Fulfillment logistics, good price, curation (assortment selection) or site navigation
Social media platform (facilitate connections and communications among users)	Facebook, Instagram, WhatsApp Messenger, Twitter, TikTok, Slack	Users (i.e., consumers and firms that generate content), app developers	Users (i.e., consumers and firms), advertisers	Monetization, ad targetability, direct network effects, privacy, creating a sense of community
Matchmaker only platform	Upwork (formerly eLance), LinkedIn Corporation, eHarmony, Monster.com	Users (i.e., consumers or firms)	Users (i.e., consumers or firms)	Content and curation, heterogeneity of supply and demand
Service platform, including social-sharing platform	Uber Technologies, Airbnb, OpenTable, Utelier.com, Expedia Group, SeatGeek, Upwork, Takl, Vertoe, Orbitz.com, DoorDash	Producers, distributors, the platform itself	Users (i.e., consumers)	Good price, heterogeneity of supply or demand. For social-sharing platforms, an additional issue could be a societal purpose.
Payment platform	Visa, Paypal Holdings, Alipay	Banks, Merchants	Merchants	Security (e.g., fraud detection), reliability (near 100%), convenience
Crowdsourcing/crowdfunding platform	Kaggle, Liveops, Indiegogo, LendingClub	Lenders (i.e., consumers and firms)	Users (i.e., consumers and firms), advertisers	Content, risk reduction, creating a sense of community
Two-sided technology platform	The App Store (Apple iPhone), Google Play, Ethereum	App developers, firms	Consumers, firms	Data, privacy, innovation

platforms (e.g., Eckhardt et al., 2019; Perren & Kozinets, 2018; Wirtz et al., 2019).

Potential Roles of Marketing in DBPs

A Brief Review of the Platform Literature in Marketing

Jia, Cusumano, and Chen (2019) identify several broad literature streams related to platform businesses, including economics, management and strategy, and information science. Most of them do not include marketing-related issues. A few papers in the marketing literature have explored platform-related issues, such as the value of a seller's reputation on platforms (Yoganarasimhan, 2013), sales force compensation in two-sided markets (Bhargava & Rubel, 2019), optimizing marketing resource allocation on media platforms (Sridhar, Mantrala, Naik, & Thorson, 2011), the effects of advertising on platforms (Fang, Li, Huang, & Palmatier, 2015; Rosario, Sotgiu, De Valck, & Bijmolt, 2016; Tucker & Zhang, 2010), the value of a “like” on a social media platform. (Mochoch, Johnson, Schwartz, & Ariely, 2017), managing risk perceptions in social-sharing platforms (Lamberton & Rose, 2012), and how platform characteristics moderate the effects of word of mouth on sales (Rosario et al., 2016). Other studies offer overviews of platform-related marketing issues. Sriram, Manchanda, Esteban-Bravo, and Chu (2015) focus on issues drawn from economics literature; Eckhardt et al. (2019) and

Kumar, Lahiri, and Dogan (2018) center their attention on social-sharing platforms. A Web Appendix to this paper provides an expanded summary of platform papers that have explored marketing-relevant issues, across a variety of platforms.

Emerging Roles for Marketing in DBPs

According to the American Marketing Association (2013), “Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.” By this definition, DBPs can be viewed as a new “type of institution” to facilitate exchanges in the marketplace. However, instead of this standard definition, we consider the definition of digital marketing proposed by Kannan and Li (2017, p. 23), as “an adaptive, technology-enabled process by which organizations collaborate with customers and partners to jointly create, communicate, deliver, and sustain value for all stakeholders.” Marketing in the digital realm is dynamic and adaptive (perhaps requiring real-time processing supported by AI and machine learning), which differs from the sequential stage-by-stage process associated with traditional marketing planning and execution.

This conception of marketing implicitly acknowledges a broad ecosystem of collaborators that are not firm- or institution-centric. The ecosystem should orchestrate a process

for designing, developing, and delivering sustainable value collaboratively, then distributed among the different users. Marketing then might be transitioning from product- or firm-centric to stakeholder-centric (e.g., all sides are stakeholders to be addressed with marketing efforts), which would imply a fundamental rethinking of current theorizing that is based on a marketer-led, two-party exchange structure.

Specifically, the main function of marketing would transform from finding customers for the firm's offerings to leveraging an ecosystem that finds offerings for customers (e.g., finding an Uber driver for a passenger, finding target customers for an advertiser). Marketing has a bigger role in DBPs than in pipeline businesses because it can facilitate a supply–demand balance in a short time frame (or even in real time) through its access to data from all users. Marketers will need to calibrate and manage both supply and demand at the aggregate level continuously, using tools such as dynamic pricing (e.g., surge prices) (Chen, 2016) and customized pricing (e.g., digital coupons).

In some cases, consumers also become producers (Benkler, 2002) who jointly create value in an exchange, so marketers should address the cocreational aspects of an offering. An exchange today could be triggered or initiated by a potential customer through a Google search to find information from the 185 million active websites (Netcraft, 2019) that might have an offering of interest to that customer. Consumers are now virtually connected in large networks such as those enabled by Facebook and Twitter, which help them actively participate in a process of value creation that is not necessarily initiated by firms. Hennig-Thurau, Hofacker, and Bloching (2013) accordingly note that marketers need to monitor and moderate consumer activities, as well as rethink how marketing functions (e.g., customer relationship management) are managed (Libai et al., 2020; Malthouse, Haenlein, SkieraSo, Wege, & Zhang, 2013). They refer to such marketing as the “pinball way,” contrasted with traditional marketing approaches such as targeting, which are akin to “bowling.”

To guide our thinking about the roles of marketing in DBPs more formally, we apply TCA, as derived from scholars such as Coase (1937), Williamson (1979, 1985), and Benkler (2002). It has a long tradition of application in marketing, especially in studies of interorganizational relationships in marketing channels (e.g., Anderson, 1985; Geyskens, Steenkamp, & Kumar, 2006; Krafft, Albers, & Lal, 2004; Rindfleisch, 2019; Rindfleisch & Heide, 1997). Although we could consider other theories (e.g., social exchange, game theory) to facilitate understanding of marketing's roles and effects in DBPs, those theories are limited when applied to DBPs. Social exchange theory (Blau, 1964; Homans, 1958) is most relevant for social-sharing platforms, and game theory (e.g., Laffont & Tirole, 1993; Nash Jr., 1950; Selten, 1965) is most applicable for explaining competitive and pricing aspects of platforms.

An important application of TCA is to articulate the optimal governance mode for transactions, that is, whether a particular exchange is best executed in open markets, governed by contracts among independent parties that might not have established relationships among themselves, or else in internal

hierarchies, governed by official policies and authority structures. A DBP constitutes an alliance among parties with hybrid governance, combining some aspects of both market-based and hierarchy-based mechanisms (Akbar & Tracogna, 2018; Andreassen et al., 2018). A principal contention of TCA is that the governance form (i.e., organizational design) should promote efficiency by minimizing transaction costs (Geyskens et al., 2006). If a DBP already exists in an industry catering to a specific market segment, we assume its existence is *prima facie* evidence that a platform structure is optimal for that context (i.e., it is the organizational structure that creates value through transactions that would otherwise not occur or would occur at higher costs in open markets or hierarchies) (Evans & Schmalensee, 2008). We use TCA to elaborate on the different transaction costs in a DBP and outline the role of marketing for reducing them for all users.

Fig. 1 summarizes our conceptual framework, outlining how a DBP's marketing function might reduce transaction and production costs for all parties and increase the benefits realized by users. In the initial phases of a DBP's growth, the focus is primarily on creating value by reducing transaction costs for users and encouraging them to use the DBP for their transactions. In later phases, as more users join the platform, the emphasis shifts to value creation, by enhancing the benefits for all users and boosting repeat uses. We highlight three important aspects of our framework:

- (1) There are at least three parties associated with a DBP (buyer, seller, platform), which implies transactions among at least three types of dyads: the DBP and its sellers, the DBP and its buyers, and buyers and sellers. We explore how the marketing function can facilitate interactions and transactions among all parties.
- (2) Per the tenets of TCA, we distinguish transaction from production costs. Transaction costs result when a user undertakes activities to decide whether to join a DBP and engages in specific transactions after joining. The DBP incurs transaction costs when it promotes itself to recruit potential buyers or sellers to join, curates offerings for specific customers, arranges delivery, and so on. Its production costs are all those incurred from running the platform, regardless of whether a transaction takes place (e.g., day-to-day operations, including costs of technologies that enable matching buyers and sellers, costs of IT infrastructure, managing personnel, monitoring performance) to ensure that transactions between buyers and sellers are completed with minimal friction. For users, cocreation activities to consummate a transaction are production costs, because they contribute to the creation of the final offering exchanged.
- (3) We distinguish several types of transaction costs: *ex ante* (before a user joins the DBP) and *ex post* (after a user joins a DBP), as well as direct and indirect costs (e.g., opportunity costs such as loss of profits for actions not taken). Transaction costs arise due to three characteristics of transactions (Williamson, 1975): asset specificity, uncertainty, and frequency. Therefore, parties to a

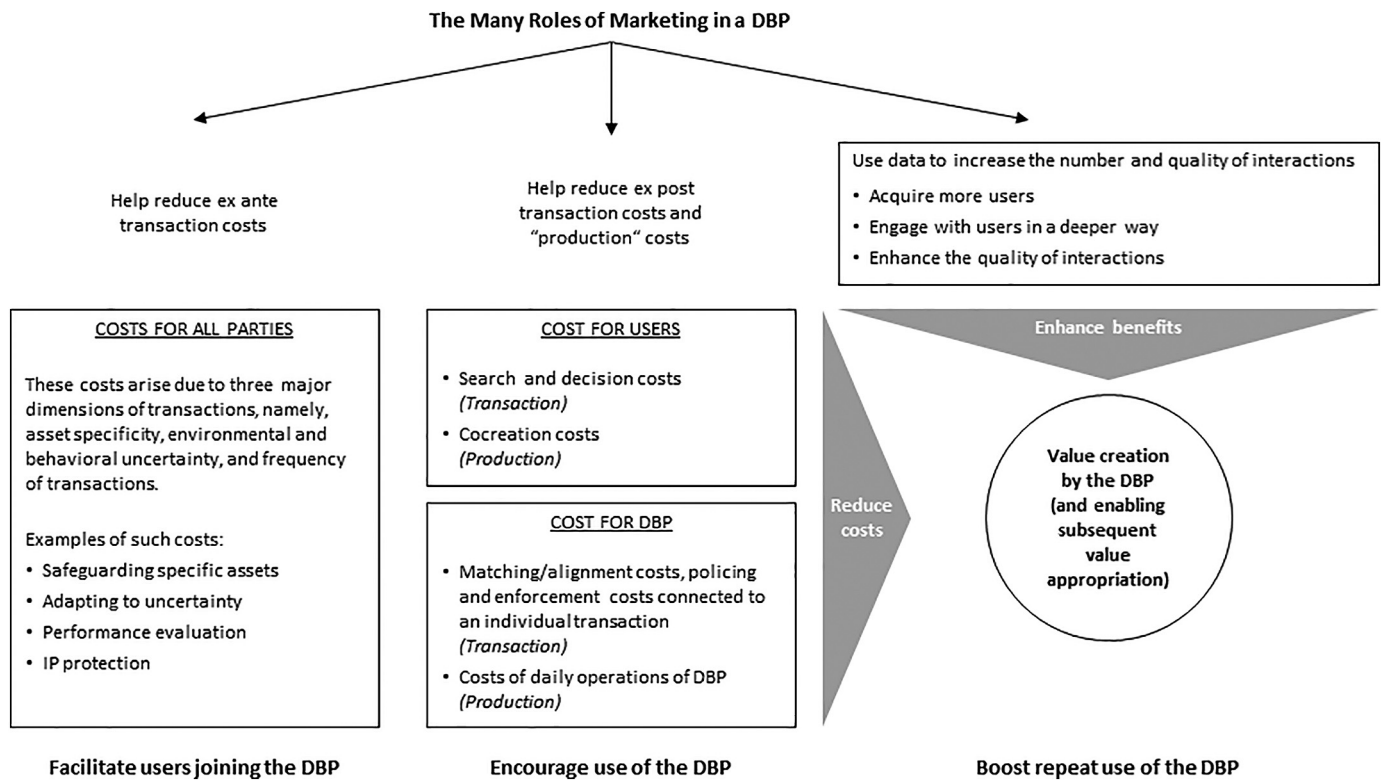


Fig. 1. A transaction cost framework for understanding how marketing improves the performance of DBPs.

transaction incur costs to safeguard their assets, adapt to uncertainty, and for evaluating performance (Rindfleisch & Heide, 1997). In Table 2, we summarize different types of transaction costs incurred by a DBP to establish transactions or relationships with sellers.

Examples such as those in Table 2 could be developed for each party in other dyads on a platform (e.g., DBP–buyer, buyer–seller). For example, buyers and sellers incur ex ante transaction costs if they invest in DBP-specific assets (e.g., costs incurred by an Amazon.com affiliate to set up an IT system that is not of any value outside that platform). A buyer also incurs ex ante transaction costs when there is high uncertainty about the offerings on the platform (e.g., consumers' perceived uncertainty about the quality of Airbnb hosts). As a result, a DBP's customer acquisition cost goes up if potential buyers or sellers perceive higher ex ante costs from becoming users of the DBP. Thus, a DBP has every incentive to reduce the transaction and production costs for all parties (e.g., simple sign up for buyers if they provide an ID, password, and credit card details).

Among the three dimensions of transactions that drive costs, David and Han (2004) find that asset specificity is the most important. In a DBP, asset specificity is typically a concern in the DBP–seller dyad. With bilateral asset specificity, both the platform and the supplier have incentives to reduce the associated transaction costs (or build stronger relationships). However, if suppliers incur most of the costs due to asset specificity, the DBP needs to minimize overall costs to encourage suppliers to join. Advertisers on Facebook make

substantial investments to build a community on the platform, but Facebook owns all the connections among the advertisers' community members and the data about the interactions among these community members. Thus, Facebook imposes substantial asset-specific transaction costs on advertisers, but it attempts to reduce other costs for the advertisers to make its DBP attractive.

The most important role for marketing in DBPs is to increase the benefits for all parties (Hoyer, Kroschke, Schmitt, Kraume, & Shankar, 2020). From the perspective of a DBP, marketing can promote a better understanding of its users and their needs, which can reduce matching costs (e.g., errors because of incorrect matching) and policing costs (e.g., ensure the types of suppliers and their offerings meet customers' needs). It also can reduce transaction costs by: (1) targeting and encouraging the right types of buyers and sellers (e.g., Uber drivers) to join the DBP, (2) reducing the overall costs of user acquisition via appropriate communication and media strategies, (3) simplifying search and screening processes to facilitate transactions, and (4) establishing policies and procedures (e.g., customer support) that reduce frictions for all users. In a related sense, marketing can simplify transactions. For example, by incorporating a PayPal payment option, eBay reduces transaction costs that arise from the uncertainty associated with direct payments between buyers and sellers (e.g., refunds for lost shipments) and reduces the production costs for the DBP and the buyers by ensuring smooth, reliable, frictionless payment processing. At the same time, buyers' uses of PayPal increase the production costs of doing business for sellers on eBay. Uber reduces ex ante transaction costs for riders by conducting background

Table 2
Examples of transaction costs incurred by a DBP in the DBP–seller dyad.

	Direct costs	Indirect (opportunity costs)
Ex ante transaction costs	<ul style="list-style-type: none"> • Ex ante “safeguarding” and verification costs (e.g., background checks conducted by Uber and Airbnb before onboarding users). • Marketing costs to identify and recruit the right types of users. 	<ul style="list-style-type: none"> • Costs to eBay or Amazon.com because a new seller might sell low-quality goods or shirk from taking contractual actions consistent with the DBP brand (e.g., potential loss to reputation, long-term loss to sales). • A sexual predator might become an Uber driver (e.g., potential loss of future sales, platform reputation loss).
Ex post transaction costs	<ul style="list-style-type: none"> • Integrating users onto the platform (e.g., onboarding costs; marketing costs to retain existing users, referred to as “bonding” costs; Williamson, 1985, p. 21). • Costs incurred because a new seller might sell fake goods, thus requiring reimbursement to buyers (e.g., eBay, Amazon.com). 	<ul style="list-style-type: none"> • Loss of future DBP sales because of the inability of a seller to deliver products within specified times (e.g., Etsy), which is a form of “maladaptation” costs (Williamson, 1985, p. 21). • The publisher has inappropriate content unsuitable for some mainstream advertisers (Google). • Buyers and sellers engage in direct transactions outside the platform (i.e., “leakage”)

checks on drivers; it reduces transaction frictions for drivers and passengers in developed countries by automatically billing them for the ride. (In developing countries, where many people do not have credit cards, Uber drivers accept cash, which reduces transaction costs for these buyers.)

As shown in Fig. 1, a strategic focus on increasing the number of activities and interactions that take place on the platform helps build user loyalty. A transaction is one type of interaction; a single transaction might require several interactive steps (e.g., log in, search, order, chat with a counterparty, pay). Minimizing the number of steps generally reduces the cost of interactions (e.g., one-click ordering) and increases the total number of interactions on the DBP through repeat engagements by the same users or attracting more users. When additional interactions confer user benefits, a DBP's performance also improves. For example, 48% of Amazon Prime members shop on Amazon.com at least once a week (Statista.com, 2019).

As Parker et al. (2017) point out, platforms are designed one interaction at a time, and the design of every platform should start with the design of the core interaction that it enables. This focus is particularly relevant for the interaction between producers or suppliers and consumers, which result in an exchange of value. This exchange is the single most important activity that takes place on a platform and is the reason most users are attracted to it in the first place. However, repeat use of a DBP is also driven by other, more interpersonal dimensions (Gui, 2000) that users experience when engaging with the platform, before, during, or after the actual transaction (Buchanan, 2001). Thus, when considering how to boost loyalty to the platform, the entire exchange process and associated activities are relevant. Marketing should aim to influence the entire range of user interactions, not just the transaction (Hoyer et al., 2020).

In a pipeline business, customer interactions are typically sequential and structured. In a DBP, interactions are multidimensional, non-sequential, and less structured. A DBP constantly humming with interactions likely generates thick markets on all sides, ensuring the stability and liquidity of the platform. The interactions also provide the platform with the energy to persist, and with more energy generated, the platform

is more likely to succeed. A key function of marketing is to ensure an adequate number of quality interactions, akin to its function in driving traffic on non-platform websites. However, interactions for the sake of interactions (e.g., clickbait) might not be valuable. They might enhance user awareness and short-term engagement but are unlikely to generate long-term loyalty. Therefore, interactions on a DBP must be of sufficient quality to ensure follow-through activities, communications, and exchanges that eventually create value for users.

The Components of Interactions

Gui (2000) depicts an interaction as a productive process in which agents exchange ordinary goods or deliver services and create and simultaneously consume relational goods. Wagner (1994) defines an interaction as an interplay and exchange in which individual people and groups influence one another. In turn, we identify three aspects of interactions that are relevant to DBPs: (1) the interplay, (2) the influence of users on one another, and (3) the exchange of value among users.

The DBPs are central to generating interplays among people or groups by providing efficient and effective ways to match entities that have offerings with those who want the offerings (Benoit, Baker, Bolton, Gruber, & Kandampully, 2017). However, facilitating the interplay is not solely the responsibility of the DBP; users could actively contribute by providing the information needed to complete the matchmaking task (e.g., Piller & Sothinathan, 2017). The influence that users exert on one another may be direct, through choices and decisions, or indirect, as aggregate choices in a marketplace (Hartmann et al., 2008). The exchange of value between providers and customers is the third aspect, and here, the role of a DBP is to ensure low transaction costs in exchange for value (Afuah, 2013; Katz & Shapiro, 1994). In DBPs, the exchange does not need to include goods or services for monetary value (Habibi, Kim, & Laroche, 2016) but also can have social aspects (Luca, 2015), such as promoting a positive sense of self (Cillessen & Bellmore, 2010; Valkenburg et al., 2005), establishing new relationships (Lenhart & Maddan, 2007; Pempek, Yermolayeva, & Calvert, 2009), or enhancing current relationships (Madden, Cortesi, Gasser, Lenhart, & Duggan, 2012; Pempek et al., 2009). A

DBP needs to leverage all three components to scale its number of interactions. The exchange of data and information among parties also is important in this context. For example, before buyers and sellers engage in an exchange of value, they must trust each other (Schlosser, Barnett White, & Lloyd, 2006), and trust is facilitated by sharing data, such as user reviews. Coyle and Yeung (2016) show that reviews by Airbnb hosts affect the behaviors of guests and vice versa.

Scaling the Interactions on a DBP

Generating many interactions of high quality increases the potential revenues of a platform and produces additional data that provide future revenue-generating opportunities and potential competitive advantages (Gupta, Leszkiewicz, Kumar, Bijmolt, & Potapov, 2020). For example, high-quality interactions enable Uber Technologies to determine when to implement surge pricing (Chen et al., 2018) and eBay to make product recommendations (Li & Netessine, 2018). Marketing can enable platforms to increase the number of interactions by: (1) attracting and retaining more users to the platform, (2) enhancing the quality of the interactions, and (3) engaging with those users in a deeper way.

Attracting and Retaining More Users to the DBP

Having more users on a platform increases the number of interactions. Compared with the growth strategies of pipeline businesses, platform growth is influenced by additional considerations such as the openness of the platform to new users and new types of interactions. Yun, Won, Park, Yang, and Zhao (2017) find that network effects depend on having the right amount of platform openness, such that platforms need to define, and adapt over time, how open they want to be to their users and how much freedom users will have to frame their interactions (Parker & Van Alstyne, 2017). If DBPs are too closed, the number of users might become too small to generate attractive network effects. If they are too open, there might be value-destroying effects, such as poor-quality interactions, congestion, or misbehaviors (e.g., fake profiles on LinkedIn Corporation) that cause users to defect.

Platform openness typically pertains to the access provided to suppliers, customers, and complementors, but it also should apply to product categories, communication, and distribution channels (Broekhuizen et al., 2019) that affect value creation on a DBP (Saghiri, Wilding, Mena, & Boulakis, 2017). The degree of openness enables a platform to leverage innovations developed by third parties (Constantinides et al., 2018). Innovations improve the quality of a platform's offerings, which are vital for attracting a critical mass of suppliers and customers to the platform and then to keep them from defecting (Zhu & Furr, 2016). Verhoef et al. (2019) describe platform market development as the act of introducing existing offerings on the platform into a new market through its ecosystem of users (e.g., users for Apple phones, tablet computers, wearable devices, and televisions). Platform diversification aims to create additional growth in unexplored markets with new offerings, a

strategy that expands platform access to new markets while enabling the platform to update its offerings.

Enhancing the Quality of Interactions

Another way to increase the number of interactions is by enhancing the quality of interactions experienced by users, which depends partly on the matching function. Finding a high-quality match between suppliers and consumers is challenging (Azevedo & Weyl, 2016), and an improper match increases the perceived risks for the interacting parties (Wirtz et al., 2019). Several authors provide suggestions for how to improve the quality of the interactions on a platform. Chu and Wu (2018) propose the use of reputation-based mechanisms (e.g., feedback, certification) so users can more easily find and interact (via decentralized matching). Kenney and Zysman (2016) note that the application of big data, algorithms, and cloud computing can improve the quality of the interactions. Using an analytic model, Halaburda, Piskorski, and Yildirim (2018) show that the capability of the interacting parties to filter potential matches reduces perceived costs and induces a higher willingness to pay. Benoit et al. (2017) describe how marketing can help platforms improve the quality of interactions by creating user trust and reducing risks (e.g., peer ratings, secure payment methods, service failure recovery procedures) and by shaping and communicating social norms that are considered acceptable when parties interact on the platform. Benoit et al. (2017) identify another approach for improving interactions, which they label “resource smoothing,” that manages volatility in supply and demand over time, for example with dynamic pricing or transparent communication about these patterns to users.

Engaging with Users in a Deeper Way

A DBP can gain more business from existing users by strengthening relationships with profitable users. Successful platforms tend to scale by layering new interactions on top of the core interactions (Parker & Van Alstyne, 2017). As Storbacka, Brodie, Böhmman, Maglio, and Nenonen (2016) argue, a higher level of engagement with existing users can attract additional users. The DBPs can enable targeted users to actively cocreate value by giving them the authority to perform certain activities on the platform. These activities can range from simple but engaging ones such as providing reviews to substantive activities that shift the players' roles on the platform, as when customers become suppliers (Verhoef et al., 2019) or complementors. Literature on customer engagement indicates how marketing can help strengthen the relationships between a DBP and its users, using tactics such as task-based engagement (e.g., making it easy for users to share their experiences or feedback) or social recognition (e.g., Airbnb “super host” badges) (e.g., van Doorn et al., 2010; Verhoef, Reinartz, & Krafft, 2010).

Measuring and Tracking Interactions

Apart from traditional metrics useful for managing any business (e.g., revenue, profitability), a DBP must monitor and

boost the performance of the core interactions (Van Alstyne et al., 2016). Thus, DBPs need to deploy interaction-centric metrics such as transaction volume (number of interactions), user adoptions (number of registrations, subscriptions, or users) (Altman & Tushman, 2017), and interaction failures (Van Alstyne et al., 2016). Benoit et al. (2017) propose measuring service experiences and outcomes for customers (e.g., service usage, repeat purchase behavior, word of mouth) and suppliers (e.g., efficiency, revenues, profits). Such outcome-related metrics can identify and diagnose potential performance issues and prevent their recurrence. Several intermediate fine-grained digital metrics are valuable in this regard too (Verhoef et al., 2019), including those based on online sentiments and engagement and network-focused metrics (Van Alstyne et al., 2016), such as content sharing, repeat visits, amount of cocreation, or value sharing. For example, when judging the success of their app developer network, Apple and Google benefit from measuring the number of developers creating apps for their app stores, the revenues generated by those apps, and customer satisfaction with those apps. Examples of network metrics include congestion measures, misbehaviors, and response times, such as the use of the “Order Dissatisfaction Rate” by Etsy to measure the quality of customer service provided by sellers (i.e., value should not exceed 1%).

As another metric, match quality (Chen et al., 2018) acknowledges that poor matches of users and producers weaken network effects. For example, Google constantly monitors users' clicking and their dwell time on the pages and the depth of material on the pages clicked to refine how its search results fulfill user requests (Van Alstyne et al., 2016).

Value Creation and Value Appropriation in a DBP

The most important measure of a DBP's potential success has to do with its ability to generate value (economic, social, and psychological) and share that value with its users. It must first create value, then appropriate that value by establishing a sustainable competitive advantage (Mizik & Jacobson, 2003). Value creation and appropriation are complex in a DBP because it needs to coordinate the resources of multiple parties to find the most efficient uses for them.

Value Creation in DBPs

One important source of DBPs' value creation is that digitization reduces the transaction and production costs of many routine activities, thereby lowering the overall costs for all users compared with the same activities executed by pipeline businesses. The time savings in execution or the reduction in frictions are valuable to platform users (Evans & Schmalensee, 2016). For example, DBPs can reduce search costs for all parties through improved content curation and better matching among different sides. Another compelling way for DBPs to create value is by monetizing slack resources, which is the underlying logic for Airbnb, Uber, eBay, and SeatGeek (Modly et al., 2020). Unused slack resources generate

little value for their owners but can be monetized by a DBP, to generate value for the owner and the users.

Value Generated by Network Effects

Indirect or cross-side network effects are typically efficient and effective in scaling DBPs (Wirtz et al., 2019). At the margin, the mere existence of one more user on one side likely makes one more user on the other side even more valuable (Dellaert, 2019; Tucker & Zhang, 2010). Because additional users create value for existing users, the overall value generated by a DBP spirals upward, attracting even more users and creating additional value for existing users (Gupta, Mela, & Vidal-Sanz, 2016). For many social media DBPs such as Facebook, TikTok, and Instagram, direct network effects are particularly important, because value is enhanced by better connectivity to users on the same side such as family and friends.

To start creating value through network effects, a DBP can use a divide-and-conquer approach, subsidize one or more sides of the platform, and build scale on all sides. For example, Groupon offered free listings to merchants in return for a small cut in the resulting sales, which enabled it to create adequate thickness on the supply side to make the platform attractive for buyers. To improve match quality during the scaling process, the optimum level of thickness should be higher in DBPs with more heterogeneous assets, offerings, and user tastes (Akbar & Tracogna, 2018; Evans & Schmalensee, 2010).

Network effects can also be negative and decrease the value realized by platform users (e.g., congestion, fake offerings, fake information). A platform could perversely use the data and insights from the marketplace to reduce the value realized by its users on one or more sides of the platform (e.g., by integrating and absorbing one or more sides within the platform; front running by market makers, as in the stock markets, to reduce value on the buyer side).

Understanding positive and negative network effects are critical for platform owners and users, particularly on the supply side. For example, once enough listings of a specific item are available on eBay on a specific day, additional listings only increase the supply-side competition without attracting additional buyers, which reduces prices realized by the sellers. As a result, sellers might choose to list an item of interest when there is less competition. This aspect becomes critical in the case of centralized matching (e.g., Uber), which needs only the number of matches to clear the market. Additional matches of the same or lower quality do not add value (Wirtz et al., 2019). For example, a new driver of a ridesharing service recently informed one of the authors that he only accepts two trips a day: one on his way from to work, and one from work to home. His offer on the platform is highly unique; he lists a starting point close to his home and a drop-off point close to his office at a specific time in the morning and evening. The user had an equally specific need to commute to and from work. The match quality on this ridesharing platform could be operationalized for passengers and drivers based on the importance weighted

differences between the offer attributes and user needs (e.g., does a user have flexibility in wait time, does a trip request provide a longer ride for the driver). Once the liquidity is sufficiently high to minimize the weighted differences on the key attributes, any added network size does not add much value to the users.

Value Appropriation

The prices a DBP charges its users on one or more sides is the primary mechanism for value appropriation. The price might have different components, such as a membership fee to join the platform, a usage fee based on the number of transactions, or a commission on transactions (Choi & Mela, 2019). Pricing is more complicated in DBPs than in pipeline businesses because the pricing strategy determines how fast the platform scales and reaches an adequate number of users on multiple sides. The pricing structure also needs to ensure that the value realized by users is attractive enough for them to continue participating. A DBP might need a dynamic pricing mechanism to coordinate the operations and ensure supply–demand balance. Another complexity arises from the differences in the locus of control to determine prices on a platform. A price can be set by the platform (e.g., Uber, Amazon.com), determined by auction (e.g., eBay, Tophatter), set by sellers (e.g., Amazon Marketplace, Airbnb, SeatGeek), or negotiated (e.g., Pricewater).

A pricing issue that has generated considerable attention in the economics literature is the possibility of subsidizing one or more sides of the DBP, then appropriating value from the other, paying sides. For example, eBay is still free for buyers and sellers and advertisers pay to participate (e.g., listing fee, transaction fee), but in its formative years listing was free for sellers, to scale the platform (under its original name AuctionWeb). In its early years, Uber subsidized drivers with minimum guaranteed payments to get them to join the platform. Chan (2019) shows that cross-subsidies among a platform are an equilibrium outcome of a game in which a two-sided platform sets prices, and the players on the two sides decide whether to join. If there are positive indirect network effects (i.e., strategic complementarities among agents on different sides of the platform), the cross-subsidy strategy is optimal whether there are heterogeneous users on each side, as in the case of monopoly platforms, or when there is a dominant firm among multiple platforms competing for the same users. These game-theoretic analyses also show that in two-stage games (i.e., in the first stage, the platform announces the prices, and in the second stage users decide whether to participate), it is not optimal for a platform to set prices that extract the entire surplus value created through matching if it wants to avoid the equilibrium outcome whereby users on both sides do not join in the second stage.

Value appropriation becomes even more challenging in the presence of platform competition, as when users resort to “multi-homing” and DBPs must compete for the same customers (The Wall Street Journal, 2020). Any value created by a platform can be appropriated by non-platform users or complementors (e.g., taxes, advertising costs paid to companies

that drive traffic to the platform). Some features of DBPs can offer protection from competition, especially if the platform's network is large enough to act as a barrier (Duch-Brown, 2017; Johnson, 2018), and the resulting liquidity is difficult to replicate (Wirtz & Ehret, 2019). If the value created is the result of the joint capabilities and actions of the users rather than the features of the offerings themselves, it could enable the platform to extract value (Lusch & Nambisan, 2015; Ramaswamy & Ozcan, 2018).

Uninformed observers tend to believe that the plethora of DBPs that have appeared in recent suggest they represent a proven business model for generating profits and success. However, the challenges associated with both value creation and value appropriation paint a different picture. The odds of success for a DBP are low due to the challenges of scaling the platform; conditional on successful scaling though, the odds seem good for generating considerable value for all players and wealth for the platform owners (e.g., Zhu & Iansiti, 2019). Still, even highly successful companies such as Google and Apple have failed in some DBP ventures. In early 2019, Google abandoned Google+, a social media platform it started in 2011, and in 2012, Apple shut down its social networking site iTunes Ping. Deep pockets did not help generate a big enough user base for these companies. In other words, putting a bad business concept onto a platform will not improve value appropriation (Cusumano et al., 2019). New DBPs can succeed if they can scale and generate substantially more value for their users than competing platforms or business models. We thus conclude this section with a summary of the roles of marketing for value creation and value appropriation on DBPs:

- It significantly increases the number and quality of interactions on a DBP by helping attract the right types of users (buyers, sellers, and complementors), enabling them to engage deeply with the platform, simplifying user cocreation of value (e.g., decentralized matching), facilitating repeat transactions, and so on.
- Marketing creates value for all users (not only buyers); it can help appropriate value by managing pricing strategies (e.g., subsidizing one or more sides, facilitating dynamic pricing).
- It can help a DBP explore and facilitate all types of interactions (i.e., value exchanges), including those that generate psychological and social value and thus go beyond an exchange of an offering for money, as well as value exchanges based on access to resources, other users, social attention, or valuable information.
- Marketing can help a DBP focus on finding the right offerings for buyers (more than just finding buyers for offerings) and finding buyers for sellers.

Governance of DBPs

Value creation and appropriation are enhanced by good governance to structure and manage the organizational processes (Zachariadis, Hileman, & Scott, 2019). Although good governance is a challenge for any business, it is a greater one for DBPs, due to their collaborative value creation process.

According to Mukhopadhyay and Bouwman (2018), the DBP and its users do not have formal authority over other users and partners. Thus, relationships between platform owners and its users are different from, and more challenging than, structured principal–agent relationships in traditional channels and buyer–seller relationships. In some cases, there can be more than one platform “leader” (e.g., DBP and strong supplier brand), which creates more complications.

As complex ecosystems, DBPs “require stability and homogeneity to leverage common investments in standard components, [but] they also need variability and heterogeneity to meet evolving market demand” (Wareham, Fox, & Giner, 2014, p. 3). A recognized challenge in platforms is how to establish governance mechanisms that appropriately bound participant behavior without constraining their innovativeness (Constantinides et al., 2018). A DBP that has more, and more diverse, partners is likely to be more innovative and valuable, setting the stage for it to develop in unanticipated directions. For example, Amazon.com has been transforming itself continuously, which would be difficult with a restrictive governance code. Yet fewer constraints also may increase governance complexity. A diverse set of partners means more diverging objectives and conflicting interests. In an example of inherently conflicting interests, Cambridge Analytica sought to exploit user data provided by Facebook, but it was in the interest of Facebook to protect users' privacy (The New York Times, 2018).

According to Tiwana, Konsynski, and Bush (2010, p. 679), platform governance needs to resolve “who makes what decisions about a platform,” such that the design for governance might adopt three perspectives: (1) decision rights partitioning, (2) control, and (3) proprietary versus shared ownership. Decision rights partitioning refers to how decision-making authority gets divided between the DBP and its users. Decision rights refer to who has the authority and responsibility to make specific decisions, what decisions are within the authority of the DBP, and which decision areas are under the purview of other stakeholders and users. Control refers to the formal and informal mechanisms implemented by a DBP to encourage desirable behaviors by users, and vice versa. The final governance attribute is whether a DBP is owned by a single firm or shared by multiple owners. These three aspects are likely interrelated. Ownership confers decision rights and the ability to execute formal control; with fewer decision rights, a platform would require more informal influence mechanisms to get things done.

The DBP owners and leaders can apply different forms of control to influence the behaviors of users and partners and manage the ecosystem, including input, output, and other types. First, input controls (e.g., Amazon.com Associates Program operating agreement, eBay user agreement, Uber partner agreement) specify who can enter or join the platform, according to more or less stringently formulated criteria. By selecting who can offer apps, the Apple iPhone platform exercises control and sets expectations for the behaviors of app developers. However, users can behave in ways that diverge from anticipated or expected behaviors. Behavioral control

means specifying standards and required behaviors by platform users and monitoring them. Such control likely requires considerable time and effort on the part of the platform owners and managers, which is difficult to achieve in rapidly evolving environments and constrains platform growth and responses to opportunities. In addition, many DBPs have limited personnel and are not designed to apply behavioral controls over users.

With outcome control, users are evaluated based on their performance or the extent to which they meet defined requirements (Mukhopadhyay & Bouwman, 2018). With such controls, DBP owners do not micromanage the platform but evaluate users on criteria relevant to the DBP's strategic objectives. For example, Uber deactivates drivers and passengers with low ratings. In choosing the appropriate form of control, an organization makes trade-offs based on risks and costs.

There are other control options too. Ethereum is a decentralized platform that provides blockchain operations, with little direct control over users. An intermediate type of governance is community-based as in the R software platform. The largest platform, arguably, is the Internet, which is a community-governed enterprise (O'Mahony & Ferraro, 2017).

Marketing can support improved governance of a DBP. For example, it can offer content management tools to reduce inappropriate content. Through effective communications, it also might minimize inappropriate feedback, set up escrow accounts, reduce interaction risks (e.g., matching women drivers with women passengers at Uber, deleting fake content on Facebook), orchestrate day-to-day operations (Chen et al., 2018; Van Alstyne et al., 2016; Wirtz et al., 2019), and build a culture that prioritizes corporate digital responsibility (Lobschat et al., 2020).

Research Opportunities

Although DBPs have been around for a couple of decades, they still represent a nascent business form, and there is much to learn about them, their potential evolution, and how marketing can improve their performance. A few recent marketing studies summarize potential research issues (e.g., Eckhardt et al., 2019; Mody et al., 2020; Sriram et al., 2015; Wirtz et al., 2019). Our framework (Fig. 1) provides new perspectives, organized according to theoretical/substantive questions, empirical/methodological efforts, and managerial issues.

Theoretical/Substantive Research

Many theoretical issues remain to be explored regarding the roles and contributions of marketing to DBPs. Marketing should cater to the needs of users on all sides of the platform, including suppliers and complementors, not just to “traditional” customers. Further research could explore the trade-offs associated with value creation and value appropriation involving parties that might have different needs with respect to the same exchange.

For example, in 2015 and 2016, 68% of U.S. Uber drivers stopped driving within six months of starting (Brown, 2019). Research might explore whether interaction data available to platforms could be leveraged to increase value for all users (e.g., Gupta et al., 2020). Both Uber drivers and passengers might benefit from knowing more about a specific ride (e.g., time to complete a trip). In addition, drivers might find it useful to know where there are likely to be shortages of drivers (e.g., based on demand distribution data from different locations at different times). Additional research might contribute to a broader understanding of the efficacy of incentivizing tools available to DBPs (e.g., evangelizing, milestone, badging, documenting) to increase interactions and build supplier and partner loyalty (Chen et al., 2018; Perren & Kozinets, 2018).

We also need theoretical analyses of various decision-making processes by users, such as the decision journeys of customers. How and why do customer journeys differ on platforms versus pipelines, and what are the implications for consumer awareness, search, consideration, purchase, and post-purchase activities? How do multi-homing options (e.g., availability of both hotels and Airbnb in a location) influence customer journeys? Moreover, many platform processes could be automated, such that they would not require active decision making by users, and previously sequential processes could become non-sequential, which would also influence customer journeys. Other studies should determine whether and to what extent pipeline businesses should adopt best practices from DBPs to improve their customers' journeys (e.g., taxi companies developing apps for their driver–customer interfaces) (Mody et al., 2020)?

A related research question involves the relationship between search costs and match quality on DBPs. When DBPs scale, they increase search (transaction) costs for buyers (e.g., more options to choose among) but simultaneously improve match quality. Theoretical insights about the nature of the relationships among network effects (i.e., scaling by direct and indirect network effects), user heterogeneity, search costs, and match quality would be of interest for both theory and practice. What are the individual and joint contributions of these factors to a DBP's success, and what are the relative costs and benefits of centralized versus decentralized search on match quality?

Several research issues arise from theoretical expectations based on our TCA framework (Fig. 1). An analysis of the various types of transaction costs incurred on DBPs, similar to Table 2, could articulate the conditions in which intermediate governance forms might provide an enduring mechanism for success. Most applications of TCA in marketing involve dyadic relationships (e.g., buyer–seller, franchisor–franchisee), though some contexts might involve one-to-many relationships (e.g., one manufacturer–many distributors). It might be worthwhile to test how transaction costs faced by different types of dyads engaged in transactions affect the performance of DBPs. For example, what are the relative effects of ex ante costs, ex post costs, and the magnitude and quality of interactions on DBP performance? Conditional on users being on the platform, what are the relative effects of ex post transaction and production

costs on the number of interactions that take place? Answers to these questions would generate both theoretical and practical insights. A related research issue involves the typically low ratio of production costs to transaction costs, compared with pipeline businesses. A low ratio value is favorable for generating good operating margins for DBPs, but the conditions in which they engender long-term success are unclear.

Different network configurations may influence DBP adoptions on different sides and overall DBP performance. Some DBPs operate mostly in contexts in which network effects on the supply and demand sides occur locally (e.g., Uber, Grubhub), others reflect local supply but global demand network effects (e.g., Airbnb), and still others operate in a context of global supply and demand network effects (e.g., Google, Facebook). To develop generalizable insights about network effects, further research might explore models of community structures, as presented in social network theories (e.g., Newman, 2003). Some additional research questions could be informed by existing or new theories:

1. *What are the downsides that arise from DBPs?* Current euphoria about platforms ignores some critical concerns, which suggest the potential to reduce consumer or societal welfare. The erosion of privacy is an ex ante transaction cost that is high for some users. The DBPs have data about all users, parts of which they can share with other users often to benefit all users, or else to the detriment of certain users, leading to a potential reduction in welfare (Lobschat et al., 2020). The ownership and use of data generated on DBPs are subject to much societal debate that likely will intensify, offering many research opportunities for scholars.
2. *Is competition (or potential competition) among DBPs enough to overcome anticompetitive outcomes?* There are concerns that DBPs represent an attempt at monopolization. Positive indirect network effects can lead to winner-take-all markets (Dubé, Hitsch, & Chintagunta, 2010), with adverse long-term effects for societal welfare, such as higher prices and lower levels of innovation (Khan, 2017). Platforms such as the Expedia Group impose price parity clauses on participating hotels (i.e., the participating hotel cannot sell rooms at a lower price than what they list on Expedia), thereby restricting competition.
3. *What approaches (e.g., incentives, price mechanisms, technology tools) are most effective for minimizing negative externalities?* The negative externalities of DBPs include the promotion and spread of misleading, rude, or offensive comments, fake information, or counterfeit products. A related issue is that the curation and recommendation algorithms used by content platforms, such as when YouTube steers users toward videos with high “engagement” scores, which typically take extreme positions. These algorithms can have adverse effects by promoting falsehoods, questionable offerings (e.g., weight loss), or radicalized arguments (e.g., Tufekci, 2018).
4. *Under what conditions is curation a better option than matching, and under what conditions should complementary*

approaches be used? Unlike matching (centralized or decentralized), which is initiated when a consumer actively searches to satisfy a specific want, curation implies expertise-based proactive actions by a DBP to assemble an appropriate set of offerings that will appeal to one or more users. Curation can be implemented by imposing restrictions on the supply or demand sides, that is, by defining *ex ante* verification criteria that enforce product quality standards for authorized users (e.g., COMATCH, Wucato). Alternatively, the restrictions could be imposed within the matching algorithm. Resellers and some DBPs are already experimenting with curation. For example, Birchbox (beauty-related offerings) and BeRightBack (travel) are subscription services that curate offerings for customers. Curation and personalized offerings typically are more expensive, unless automated using recommendation agents (e.g., Amazon Marketplace).

5. *Does the adoption of DBPs by users follow different patterns of diffusion than described by traditional diffusion models?* Technology adoption has long been a subject of research interest, but DBPs represent a different kind of context, because of the strategic complementarities across the different sides of a DBP but potential substitutability on the same side. How do different degrees of complementarity and substitutability influence the timing of adoption on all sides of a DBP? If adoption alternates across sides, it might indicate distinct roles of the same side and other sides in influencing the timing and depth of adoptions in a target population.

Empirical/Methodological Research

Empirical questions regarding DBPs highlight the need for careful research to measure and document their effects on platform users, business performance, and society at large. The tremendous growth of DBPs in recent years raises a core empirical question: Under what conditions, and on what criteria, do DBPs perform better than traditionally structured pipeline businesses for the same offering? Performance metrics might include return on investments, return on invested capital, customer satisfaction, and market valuation. Summarizing and explicating the average performance of different types of platforms (after accounting for survivor bias) would be a useful first step. Successful platforms appear to generate substantial upsides compared with pipeline businesses. Cusumano et al. (2019) report that the average revenue per employee for *Forbes* “Global 2000” companies, most of which are pipeline businesses, is \$295,000, compared with \$380,000 for one-sided innovation platforms (e.g., Microsoft Corporation) and \$333,000 for DBPs. This evidence that innovation platforms perform better than DBPs is worth exploring further. In one sense, this result is not surprising, because DBPs typically incur higher costs to match different users and coordinate, which are not incurred by one-sided innovation platforms. An important empirical issue is whether observable conditions (e.g., offerings with quantifiable or objective versus subjective attributes; utilitarian versus hedonic; assortment depth; low versus high

capacity utilization) that result in lower transaction costs on platforms compared with pipelines enable DBPs to perform better.

Interactions on platforms typically occur among strangers. Therefore, users must trust the platform and other users, particularly in sharing economy DBPs in which users might meet other users in person. When users trust a platform, it translates into a higher level of trust for other parties on it (Jiang, Jones, & Javie, 2008). If a DBP owner is also a platform user (e.g., Amazon.com), there is an even greater need for users to trust that the platform will not behave opportunistically, but provide a level playing field that does not favor one user over another (Zhu & Liu, 2018). Empirical research might quantify which trust-building mechanisms (e.g., user profiles, rating scores, performance metrics, money-back guarantees, public listing of complaints) are most cost-effective for DBPs in different contexts. An equally important question pertains to the consequences of a lack of trust. If buyers trust a platform but sellers do not for example, is sellers' lack of trust less damaging?

High-quality matching is a core requirement for a DBP to succeed, because it ensures that buyers obtain offerings that meet their needs, and sellers realize a higher price than they would with a poorer match. But at some point, match quality deteriorates (i.e., inverted U response) with increasing combinatorial options available. For example, Facebook has 2.5 billion users and more than 5 million advertisers, resulting in trillions of options for matching a user to an advertiser. Provider and customer attributes also might support higher quality matching. But how does centralized versus decentralized matching influence the quality of the match? Do feedback ratings influence it (e.g., a highly rated Uber driver matched with a passenger who tips well)? Which effective matching criteria can help avoid compromises of users' privacy?

A different type of empirical research opportunity arises from the capability to apply machine learning and AI at a scale that predicts the actions of various users on DBPs using real-time data (e.g., De Bruyn et al., 2020; Rahwan et al., 2019). Such predictability enhances the anticipatory capabilities of a DBP (e.g., Grubhub anticipating meal orders and sharing those predictions with restaurants to improve response times). Developing such systems demands the empirical identification and application of the right feature sets and training data that improve the predictive accuracy. In addition, technologies such as blockchains that provide opportunities for peer-to-peer transactions have the potential to enhance platform interactions and reduce the intermediary role of platforms. Research should determine how to incorporate these technologies in DBPs to take advantage of the anonymity they provide without disrupting the platforms' data gathering and workflows.

We note two fundamental methodological issues with implications for theory and practice (Manski, 2007). First, endogenous group formation occurs when certain types of users self-select to join a side of a platform (e.g., certain types of people become Airbnb hosts), which makes it challenging to ascribe any hypothesized effect(s) observed on a platform to a

specific cause, without confounding it with the selection effect associated with the unobserved or unobservable group characteristics of users on each side. Furthermore, the outcomes on platforms occur because of interactions among users on different sides, which means that in explaining platform effects, we should account for potential dependencies among the unobserved characteristics of users on the different sides.

Second, simultaneity refers to decisions that are intertwined by users' interdependent preferences and actions. We need robust methods for estimating effects in these circumstances (e.g., structural models based on coordination games, field experiments). Using a natural experiment, Cowgill and Dorobantu (2019) show that when an ad platform improved ad targetability, it experienced reduced average revenue per ad but increased overall revenue, because the increased number of clicks and improved targetability attracted new advertisers. The data-rich environment of DBPs and the potential they offer for conducting simple randomized experiments with relative ease provide a favorable test environment for researchers to address such thorny endogeneity issues.

Managerial Research

Generalizable insights from academic research could address many practitioner questions and concerns, so we list a sampling of common managerial questions for further study.

Would platforms disrupt my market or business? Should we become a platform business, and change our focus from offerings to becoming a platform (i.e., marketplace) for our industry? Should we join existing platforms instead of establishing our own? How do we manage the transition from a legacy system to a DBP, especially given the existing channel structure?

These topics are being discussed in many companies—“by now, nearly every [pipeline] executive has navigated at least one discussion about whether his or her organization should strive to become a platform” (Brown, 2016). Pipeline businesses must consider adopting some of the characteristics of platform business models (Mody et al., 2020). Even traditional sectors such as oil and gas, which assumed they would be spared platform-driven disruptions, are being challenged by platform innovators (e.g., RigUp connects oil rig workers with rig operators) (Libert & Beck, 2019). The examples of TomTom, Garmin International, and traditional taxi companies (i.e., losing to Google Maps and Uber) are reminders of the urgency in addressing this issue. Hagi and Wright (2015) provide some guidelines for answering these questions, using an analytical model in which they compare trade-offs between the development of multisided platforms versus vertically integrating an organization. Transforming to a platform business by hosting competitors for non-core products can be more profitable for all firms, under certain conditions. Maier and Wieringa (2019) find that adding a “platform channel,” can increase sales on an online retailer's website, such that complementarity effects of soliciting a broader range of customer segments dominate the substitution effects of cannibalizing own-website sales.

Further research can guide practice by exploring what makes certain industries and markets more or less prone to platformization. For example, education, medicine, and government represent important industries for further research. How might an education platform enable students to obtain credentials by mixing and matching college courses from different universities? What opportunities and challenges exist for structuring government services as platforms, with government agencies and vendors on the supply side and citizens on the demand side? Could a DBP connect consumers with specific CRISPR (clustered regularly interspaced short palindromic repeats) profiles to medical providers who can provide custom remedies? The SingPass in Singapore already offers citizens single log-in access to hundreds of government services and selected private services such as banking.

How do we develop effective value capturing strategies?

Platforms use many approaches to appropriate value through pricing strategies, but we do not know the relative efficacies of these approaches or the competitive conditions in which they are optimal. For example, Airbnb guests pay a higher fee (i.e., about 10% of the transaction amount), and hosts pay about 3–4%, because guests already receive the benefit of lower prices compared with hotels, whereas Airbnb needs listings from hosts who are willing to share their properties. Neither Amazon.com nor eBay charges a commission to buyers, but Amazon.com gets referral fees from affiliates, which vary by product category. For example, it receives a fulfillment fee if it delivers the offerings on behalf of the affiliate and a search fee if the affiliate wants a higher ranking on its listings (search fees represent a fast-growing area of revenue for Amazon.com). Empirically based decision support tools for determining whether, how much, and in what form to charge each side would benefit managers.

How should we manage strong and weak supplier brands?

How should we leverage strong supplier brands to build the DBP brand?

Little research provides theoretical or practical insights into how to brand DBPs and the linkages between platform and supplier brands (Baumeister, Scherer, & von Wangenheim, 2015; Gielens & Steenkamp, 2019). In a sense, a DBP functions as a “house of brands,” which could be a strong brand too. It is unclear how branding principles and considerations differ between platforms and pipeline businesses (Van Alstyne et al., 2016). Suppliers of weak brands on the DBP can get ready access to buyers, especially those who are price sensitive, these weak brands then piggyback on a strong DBP brand. Yet they simultaneously might dilute the DBP brand, which could hurt a less prominent DBP such as Etsy compared with eBay and Amazon.com. Furthermore, strong supplier brands might be tarnished if many weak brands appear on a DBP, though the DBP brand would be enhanced by having them as suppliers. Some suppliers sell only their weaker brands or develop a new brand just for the DBPs. For example, VF Corporation only sells its weaker brands on Amazon.com, which might not be a good strategy. Additional complexity arises because consumers become cocreators of brand stories (Gensler, Völckner, Liu-Thompkins, & Wiertz, 2013) on

platforms such as Facebook, TikTok, and Instagram, which might be more suited in a DBP environment with weak affiliations among brands than in pipelines that have stronger branding processes and guidelines.

Concluding Remarks

We started with an overview of a new, growing type of business form. We described DBPs' characteristics and distinctions from other types of businesses. We then articulated an emerging view of marketing applicable to DBPs. Specifically, marketing is now required to identify and cater to the needs of all users on all sides of a platform, and its primary role is transitioning toward finding appropriate offerings for platform users and facilitating their various interactions.

Using a new framework based on TCA, we outlined how marketing contributes to the success of DBPs by reducing transaction costs and, to some extent, the production costs for all parties, while enhancing value creation and appropriation for the platform. For example, marketing reduces the transaction costs by reducing users' perceived uncertainty associated with making transactions on the DBP, reducing search costs incurred by users by designing user-friendly search tools, and reducing a DBP's matchmaking costs through improved understanding of user needs.

Directed marketing efforts also can reduce the cocreation, production costs incurred by users by engaging them more deeply to enhance the DBP's offerings. Marketing facilitates value creation and appropriation by increasing the number and quality of interactions. Marketing also plays a critical role in scaling a DBP quickly (e.g., pricing, promotional efforts). It can enhance user retention by deepening user engagement (Libai et al., 2020). Finally, we have highlighted many areas of research to which marketing scholarship could contribute, with theories, empirical generalizations, and practice guidelines. Overall, DBPs represent a fertile area with many opportunities for researchers and practitioners.

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Appendix A. Supplementary data

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