

e-Commerce Purposes and Types from the Perspective of Transaction Cost Economics

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INTRODUCTION

‘Our review of the marketing literature suggests that extant theoretical perspectives – from the vantage points of the firm, the consumer, and society – have resulted in certain models and assumptions that may no longer be adequate or sufficient in a hyper-connected world ... characterized by networks of people, devices, and other entities that are continuously interacting and exchanging information’ (Swaminathan et al., 2020, pp. 24 and 26). Therefore, economic and social exchange between buyers and sellers form the basis of e-commerce relationships in both production (Heyman and Ariely, 2004) and consumption (Costello and Reczek, 2020).

These relationships are not without costs and according to Williamson’s (1979) theorizing of purely economic exchange, if the exchange is more frequent and transaction-specific assets are highly specialized, internalizing transactions in organizations is

preferable to market exchange. The reasoning suggests cost efficiencies from monitoring against uncertainty inherent to verification of contractual terms.

In e-commerce, four types of contractual terms appear in marketing programs as part of the value proposition: promotion, product, place, and price. While buyers search for products or brands, sellers display product information on online stores, in marketplaces and engage in various promotional activities, such as search engine advertising (Anderl, Schumann and Kunz, 2016). Thus, information exchange is the first contractual factor between buyers and sellers in online transactions. Product item characteristics are the subject of the subsequent contractual term, e.g., whether a raincoat has zippers or buttons, as well as the quantity and unit price, e.g., fixed-fee and usage-based pricing for information goods (Sundararajan, 2004). The third contractual term concerns delivery, e.g., free shipping makes returns more likely, reducing seller profits despite revenue

increase from sales volume (Shehu, Papiés and Neslin, 2020). Finally, buyers and sellers agree on pricing and payment terms based on product and delivery conditions. Buyers make the payment, sellers send the invoice, and the physical or digital transfer of the goods or delivery of the service follows payment but is decoupled from the contractual agreements.

Determining the conditions in these contracts and making modifications are costly to both buyers and sellers, to the extent that optimal pricing schemes change based on transaction costs, compared to production costs (Sundararajan, 2004). Thus, hierarchies in organizations are the outcome of efforts to reduce transaction costs, by internalizing them to reduce uncertainty-related monitoring costs (Williamson, 1975). A similar uncertainty is inherent to e-commerce. There is a lack of synchronicity between payments and exchange of products (Smith, Bailey and Brynjolfsson, 1999). Asynchronous access to rich information at low costs and improved search capabilities are nevertheless among the key strengths of e-commerce (Borenstein and Saloner, 2001).

From the theoretical perspective of transaction cost economics, e-commerce thus enables both buyers and sellers to benefit from increased matching at lower total costs, based on lower transaction costs through post-purchase satisfaction that reflect in ratings and reviews, through responsive customer service via chatbots, through costly commitments such as stylish designs, e.g., to establish trust (Bromiley and Harris, 2006), or through distributed ledgers that render information asymmetry obsolete. These investments in specialized assets and higher frequency of transactions in e-commerce evolve markets and technology in a direction to reduce transaction costs, evident in new e-commerce types, e.g., sharing economy (Sundararajan, 2016).

Transactions in business to business (B2B), business to consumer (B2C) and consumer to consumer (C2C) are relatively traditional commerce types based on whether

buyers or sellers are firms or individuals. However, individuals can accumulate capital and become professional sellers using digital technologies that keep pace with e-commerce. Similarly, manufacturers can reach end customers via online retail stores which can be established in days. The fluidity here is consistent with the premise of the transaction cost economics theory where the buyer and seller investments in specialized assets shape the nature of e-commerce types and, in turn, this evolves the market and technology required to lower transaction costs. An implicit assumption is that e-commerce is a force of innovation.

This chapter has the following structure. First, it reviews e-commerce using uncertainty, frequency of transactions and specialized assets, since these are the main analysis dimensions in the transaction cost economics theory. Following this review, traditional e-commerce types, B2B, B2C and C2C are presented within the dimensions of e-commerce purposes, namely production and consumption. In so doing, this chapter aims to accommodate future typologies to emerge and display how buyer–seller relationships can move to less cluttered or unique positions, which reduces intensity of competitive pressures strategically. Finally, the chapter concludes with a discussion of future research and limitations.

TRANSACTION COST ECONOMICS THEORY-BASED REVIEW

In marketing, transaction cost economics (TCE) is the dominant theory in the literature on channel management (John and Reve, 2010). In a study of online group buying websites, Che et al. (2015) describe website revisits as a transaction partner selection decision, on the part of the buyer, based on perceived personalization, trust, and predictability of the websites. They argue that personalization reduces transaction costs

through better matching offerings and perceived trust helps to mitigate information asymmetry-related concerns. These arguments align with reducing direct costs of safeguarding transaction-specific assets, monitoring, as well as opportunity costs for investing in production-related assets when identifying an exchange partner (Rindfleisch and Heide, 1997). In a more recent summary of TCE, Rindfleisch (2020) elaborates on how social motives, along with monetary motives in the original framework, and technology impact the governance types, i.e., market vs. firm, analysis of the original TCE, to accommodate ‘social production’ as an emerging ‘mode of economic organization.’

Thus, buyer uncertainty about the delivery of promised value, and the likelihood of finding a fair resolution, in the case of a failure, determines the expected transaction costs for a particular market exchange. Rindfleisch and Heide (1997) list ex-ante screening and selection costs and ex-post monitoring costs as transaction costs for behavioral uncertainty. In addition, communication, negotiation, and coordination costs are incurred due to uncertainty in the business environment. Teo and Yu (2005) find that shoppers who spend more time and effort to search for information, and check with retailers to monitor the process and are concerned about potential adjustments express less willingness to purchase online.

In e-commerce, if a product does not match buyer needs and is returned, the sellers’ investment in the design of a packaging that makes the return easier reduces transaction costs for the buyers. Similarly, buyers that register with a seller allow the seller to communicate with the buyer more promptly, hence reduce transaction costs for the seller. These investments of time, effort, and financial resources to lower future costs specifically for transactions between a buyer and a seller are considered as *specialized assets*.

For an online buyer, a purchase is inherently more uncertain than shopping in a physical store or through visiting a branch

office of a firm. Physical interactions allow decision makers to observe and evaluate information relevant to their explicit and tacit preferences. In that regard, at least for non-experienced buyers, online purchases are rather experiential. However, through repeated transactions, familiarity increases and some of the concerns are mitigated.

For online sellers, although transaction-only relationships are less costly to initiate and maintain, forming reciprocal relationships with buyers improves volume and longevity of the business (Kozlenkova et al., 2017). Kozlenkova et al. (2017) discuss the social value that buyers gain from market exchange to connect or form bonds in an online community, where sellers’ reputations as well as buyers’ observations of bilateral communications reduce risk perceptions. Brands increase credibility for value delivery, reviews and ratings establish social proof, as broadly relevant concepts to e-commerce from TCE perspective.

Sellers and buyers aim to increase the frequency of exchange, the trade, and thus invest in assets to reduce the high levels of uncertainty in e-commerce which is closely tied to transaction costs. Therefore, organizing as account owners on social media platforms, displaying products, receiving orders through direct messages and enabling payments through electronic fund transfers to bank accounts, organizations allow a variety of specialized investments depending on the resources and capabilities for trading, production, and consumption in product categories that serve business and consumer goals. The conceptual model in Figure 13.1, displays the linkages between the main variables of interest to the transaction cost economics theory that will be useful for the review in this section.

As Figure 13.1 illustrates, relationships are subject to transaction cost economics analysis and are represented with positive and negative signs for quantifiable effects. Transaction frequency and investments in assets are both observable variables,

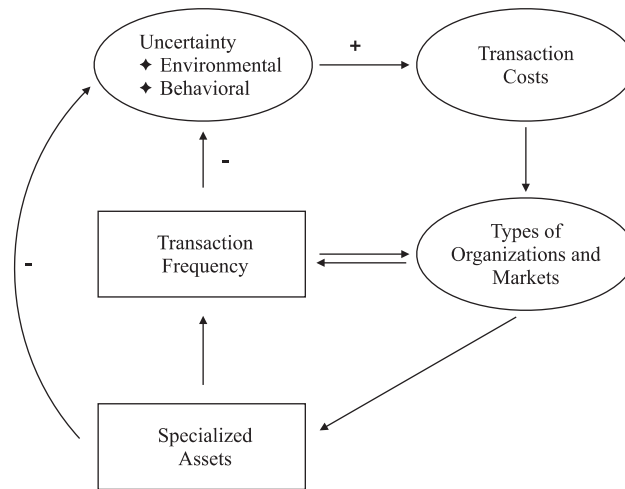


Figure 13.1 An interpretation of transaction cost economics as a conceptual model

displayed in rectangles to emphasize that natural difference. Hierarchies and markets are also observable yet are relatively subjective assessments. Finally, transaction costs and uncertainty are theoretical constructs that require operationalizations to measure. These issues are discussed in the following sections.

Environmental and Behavioral Uncertainty

In Rindfleisch and Heide's (1997) review, a notably relevant prior study is by Noordewier, John and Nevin (1990). In an analysis of 140 manufacturers for on time delivery percentages, Noordewier et al. (1990) find that simpler market exchange, e.g., with contracts specifying price, quantity, and delivery terms, outperforms exchange with relational governance when transactions are recurring but not necessarily subject to uncertainty. However, as the uncertainty increases, resources used due to inventory processing and administrative functions of repetitively used items become significant in affecting seller performance, thus impacting buyers in a business market.

In an analysis of a consumer panel data on the purchase of three apparel retail brands with online stores and physical stores in major markets, that expand into retail stores in new locations, Wang and Goldfarb (2017) report evidence for both substitution effects from online to on-premises sales and demand expansion with new customer acquisitions. In their analysis, they find that only in local markets, where there is more uncertainty – and no prior exchange between buyers and sellers, opening a physical retail store improves demand in online search and online sales. On the other hand, substitution from online store to physical store is observed for markets with low uncertainty about the sellers, inferred from the purchase history of consumers living in that area (Wang and Goldfarb, 2017).

From the buyer's perspective, uncertainty surrounds several issues: the accuracy of promotions and whether they are misrepresenting or manipulative; if the product really meets customer preferences; if delivery happens on time with products arriving in good condition; if pricing is fair; payments are secure; and additionally, whether customer data is securely stored.

From the seller's perspective, whether the customer intends to purchase or has the intentions to return after sampling is not certain. Products can be returned if they do not satisfy customer expectations, due to the tacit knowledge of the customer of the needs or non-disclosed or yet to be determined requirements. In business markets, there may be customers that are willing to take advantage of returns, e.g., to test alternatives. Transfer of funds may not happen as specified in contracts, despite delivery of products – although that is less of a concern in credit card or bank credit facilitated payments. Finally, there may be disputes about whether returned goods are in suitable condition to re-sell, and for services and information goods that require additional sensitivity to determine contractual terms.

Furthermore, although online marketplaces cherish free shipping, sellers must safeguard against the risk-taking purchase behavior of buyers, even when buyer pays for returns. The seller handles and processes each return item to restock, in addition to the opportunity cost if the item was out of stock for the shipping period or inventory costs due to replenished stocks (Shehu et al., 2020). Shehu and colleagues (2020) argue that free shipping leads to a risk premium perception associated with positive feelings towards 'risky' product categories. They find converging evidence on how uncertainty about product fit, quality and risk perceptions increase the probability of both purchase and returns, particularly observed at low frequency of transactions, through analyses including the secondary data from one of the major European online retailers which sold via print catalogs.

Indeed, online purchase behavior already has a risk premium that can discourage buyers from purchasing, unless safeguarding mechanisms, e.g., secure online payments through virtual credit cards (buyers) or 3D-secure payment infrastructures (sellers), are in place. Yet, some safeguarding mechanisms may act to reduce environmental uncertainty but increase behavioral uncertainty – if the contracting party fulfills contractual obligations

as specified. The uncertainty levels to evaluate performance in some business markets is too costly, as is the case to measure advertising returns (e.g., Lewis and Rao, 2015), which may require greater contract specificity and monitoring behaviors at higher transaction costs.

In the extreme case of digital advertising effectiveness, there are further complexities for sellers of such information products, such as indirect effects via the accentuated effectiveness of other promotional activities (Xu, Duan and Whinston, 2014), over time and across online and offline revenues (De Haan, Wiesel and Pauwels, 2016). These complexities give way to real-time bidding for click through rates predicted by machine learning and artificial intelligence technologies (Bailey, Joffrion and Pearson, 2018).

Frequency of Transactions

Frequency of transactions is a characteristic of market exchange relevant to promotions to determine the optimal effect based on budget constraints (Kannan and Li, 2017), personalization of advertisements (Bleier and Eisenbeiss, 2015) and of products by means of recommendation systems (Chung, Wedel and Rust, 2016) that incorporate ratings and reviews by other customers (Ansari, Li and Zhang, 2018).

In business markets, professional procurement departments develop a list of trusted partners among sellers through repeated transactions and extensive verification. These evolving relationships in value networks translate to return policies, affording wider tolerances in consumer markets, and motivate repeat business as opposed to one-time transactions overall.

Higher frequency of transactions between buyers and sellers increases revenue from a transactional point of view. However, in a relational engagement that generates customer equity (Kannan and Li, 2017), information from prior transactions provides

opportunity for future value generation through personalization and customization (Arora et al., 2008). Thus, personalized products, promotions, prices, and customized channel decisions reduce uncertainty for buyers and sellers.

Furthermore, buyer preferences of online versus offline stores depend on products needed in the purchase occasion, such as buying perishables in most frequented offline stores (Chintagunta, Chu and Cebollada, 2012). Frequency is a factor that affects buyer reference prices, which become more relevant as online retailers engage in more dynamic pricing over years (Cavallo, 2018). Finally, personalized pricing, possibly coupled with personalized products (Kopalle et al., 2009), allow sellers to optimize profits through first order price discrimination, by setting price levels closer to the valuations, i.e., maximum willingness to pay, of buyers (see Elmachoub, Gupta and Hamilton, 2021), whereby frequency provides data points for less biased estimation of buyer valuations over time.

The reputation of sellers and cues about their trustworthiness, which are available on platforms, are important to reduce uncertainty. For example, reviews and ratings by other buyers provide information on whether sellers have the competence and benevolence to deliver on the value proposition to the prospective buyer. Ratings are aggregate measures of transaction frequency between a particular seller (buyers) and buyers (sellers) in the market and a benefit of social commerce to improve the accountability of parties in the exchange as they expect to be scored and provide cues about commitment of sellers or buyers in their contracts.

Through analysis of e-commerce data from one of the platforms for apparel, books, electronics etc. in the United States, Mu and Zhang (2021) find that both sellers' marketing capabilities and brand reputations are effective on purchase, where they also report a negative impact of user-generated negative reviews on purchase and negative impact of

positively valanced reviews on post-purchase frustrations. However, another of source of frustration is due to perceptions of buyers' vulnerability in consumer markets, where sellers are incentivized to improve relevance via personalized advertising (Aguirre et al., 2015). Aguirre et al. (2015) find that a remedy is sellers' transparency in information collection so that concerns are less about privacy breach. Similar to the logic in reviews and ratings, buyer behavior in other websites, including non-commercial social media platforms, provide information that reduces seller uncertainties about buyer preferences, assuming good will, *ceteris paribus*.

Specialized Assets

Chintagunta, Chu and Cebollada (2012) identify transactions costs in online and offline grocery shopping based on prior literature and examples as follows: Opportunity costs of spent time, transportation, perceived difficulty and related 'psychic' costs, additional time and transportation for unavailable items, search costs for price and product attributes, and store characteristics for offline shopping.

In addition, in online shopping, consumers incur delivery costs, waiting costs, costs of receiving the delivery to home, which includes handling, and product quality evaluation costs for the buyer (Chintagunta et al., 2012). TCE theory maintains that reducing some of these costs are possible by investing in specialized assets for transactions (Williamson, 1979).

For instance, grocery stores (sellers) invest in loyalty cards and database infrastructure and consumers (buyers) provide personal information to earn points for their shopping. The loyalty card or corresponding profile on the online store is a specialized asset that is only valuable for transactions between the buyers and sellers vested in it. Although the use of loyalty cards may also increase time costs for a few seconds, there are transaction

gains, such as personalized price promotions. In online stores, these take the form of personalized product recommendations or promotions. These reduce search costs if sellers are also invested in analytical capabilities that deliver accurate predictions for products that buyers need.

Furthermore, buyers can express personalities by customizing their profiles and the user interface – again, if sellers offer that functionality through design of their online stores. On another account, when real-time inventories are well managed by sellers, they can be made accessible to buyers to safeguard against stockouts that would require adjustment costs (Chintagunta et al., 2012).

Yet another example of specialized assets is the training and vehicles that delivery staff receive. If delivery is made via drones, that would reduce some of the social costs of interpersonal interaction with strangers. Alternatively, meeting delivery personnel can be designed as a pleasurable experience. A patisserie's choice of a Mercedes-Benz luxury Smart car to deliver bakery goods is a specialized investment to communicate brand benefits with buyers which is used by, for example, Bravo Patisserie in Izmir, Turkey. Indeed, brand management aims to reduce information asymmetry between buyers and sellers by signaling quality (Erdem and Swait, 1998, in Swaminathan, 2020). Sellers particularly safeguard against imitation of their value propositions through specialized assets such as the brand logo protected by intellectual property laws.

Nevertheless, in a *hyperconnected world*, buyers can interact with the brand without permission and use this in different ways that does not necessarily alter brand equity. Robson, de Beer and McCarthy (2020) identify this as *open branding*, to emphasize the fact that brand meaning is an output of a co-creation process. Based on the selection activity, whether that is led by the customers or firm, and if contribution is fixed or open, O'Hern and Rindfleisch (2017) identify submitting, tinkering, co-designing and

collaborating as four types of co-creation. In that typology, customer-led co-creation (co-designing and collaborating), where attracting a critical mass is important, ensures repeated contributions and task-specific value generation.

Swaminathan et al. (2020) further discuss how brand ownership is shared by stakeholders, e.g., on a platform such as those in smart homes. Moreover, the sharing economy, crowdsourcing and co-creation offer asset specialization opportunities for products. Additionally, distributed ledgers, such as blockchains, shift trust frontiers between digital and physical networks (Hawlitcschek, Notheisen and Teubner, 2018), augmented reality (Matney and Hatmaker, 2021), and the Internet of Things (IoT) provide rich information (Ng and Wakenshaw, 2017; Riar et al., 2021) that connects digital and physical touchpoints in complex customer journeys (Hilken et al., 2018). This includes retail (Grewal and Roggeveen, 2020), and gaining real-time recommendations from peers in social shopping (Hilken et al., 2020), through a variety of online platforms, which are specialized assets of firms that invest in those platforms.

In a broader conceptualization of the term, one can consider these platforms as alternatives to third-party contract safeguarding identified in the earlier work by Williamson (1979). Amazon.com is an example of a platform that enters product categories selectively to compete with sellers on the platform, resulting in an increase in category demand (Zhu and Liu, 2018), and reduced prices (Cavallo 2018), arguably in part due to lowering transaction costs for buyers.

KEY FACTORS IN E-COMMERCE

Value Generation in e-Commerce

Transaction cost economics (TCE) is a useful framework to consider value generation and

Table 13.1 e-Commerce concepts from the lenses of transaction cost economics

Williamson (1975)		Rindfleisch and Heide (1997)		Relevant research areas for e-commerce	Related phenomena and concepts
Dimensions	Examples	Dimensions	Source of transaction costs	Types of transaction costs	
Uncertainty and bounded rationality	<i>Mature industry vs. new industry</i>	<i>Environmental uncertainty</i>	<i>Adaptation costs</i>	<i>Communicating new information, renegotiating contracts, coordination changes (Direct) Failure to adapt (Opportunity)</i>	Augmented reality, distributed ledger, cryptocurrency, chatbots, digital currency, e-wallets, gamification, smart contracts, trusted execution environment, voice shopping, online marketplaces, cross-border logistics
	Opportunism	Behavioral uncertainty	Monitoring costs	Selection (ex-ante), measurement (ex-post) (Direct)	Personalized recommendations, no-hassle return policies, free shipping as a signal, digital trust system
				Switching costs	User transaction history, social shopping, connected consumers, shopping experience, user interface, headless content management systems
Frequency of transactions	Recurrent vs. occasional			Identification (ex-ante), effort adjustment and productivity loss (ex-post) (Opportunity)	Influencer facilitated e-commerce
				Familiarity of buyers and sellers, trust, brand attachment, online communities	
				Reputation mechanisms	Likes, followers, online brand ambassadors
				Purchase history through profiles	Cookies
				Social proof	Ratings, stars, reviews

Specificity of supply side investments (Cost of adaptations to arrangements)	Standardized vs. custom designed products	Safeguarding against exploitation	Safeguard development (Direct) Failure to invest in productive assets (Opportunity)	Product	Crowdsourcing, co-creation, working consumers, sharing economy, connected consumer
				Distribution	Blockchain enabled value network
					Dropshipping
					Online vs. offline channel conflict and synergies
				Price	Dynamic pricing, social shopping
				Communications	Virtual stores Avatars
					Retargeting

value appropriation opportunities through e-commerce which flourish for each marketing mix area, such as place, product, price, and promotions. Yet, at a higher level this allows greater leaps through the information processing and data analysis capabilities of individuals, organizations, and complex groups of networks in online communities and platforms.

The advances in hyper-availability and accessibility of data merge with hyper-personalization and customization of value offerings for production and consumption purposes. Synergies from network externalities and social exchange lower the costs to communicate with and deliver value to buyers and sellers. Thus, transactions in the distribution channels become highly transparent and accessible to members of the value networks, to devise more efficient coordination contracts, as smart contracts.

e-Commerce offers value generation and value appropriation opportunities to design integrated marketing programs, individually developed for place, product, price, and promotions. For example, adding new distribution channels, with 24/7 availability to buyers, increasing geographical coverage, and reducing barriers to enter new markets are some of the potential opportunities to exploit in retail and distribution.

Pricing Value and e-Commerce

e-Commerce reduces search costs for products and allows for greater variety in product assortment (e.g., Brynjolfsson, Hu and Smith, 2010). Cost efficiencies from self-service-based mass customization promises higher fit with customer preferences, to reach higher profit margins.

Furthermore, real-time dynamic pricing can set prices depending on contextual factors, e.g., higher Uber prices on a rainy day, to achieve price discrimination that can further be personalized depending on more accurate estimations on the willingness to pay for each

buyer. Low-cost or no-cost returns and free shipping terms are price incentives to buyers that reduces uncertainty about lack of pre-purchase inspection of items and reluctance to purchase. In terms of promotions, rich information is available asynchronously and on demand, that allow the buyer to better control when and how to engage with content (Singh, Marinova and Singh, 2020).

A wine-bar that orders a hundred pieces of Riedel Grand Cru glassware from riedel.com (B2B) can expect to communicate with customer service, and possibly achieve a discount that a consumer (B2C) would not gain for a set of glassware purchased from Harrods retail store or Target's online store. However, as transaction costs become lower, a brand community with 100 consumers, from over 100,000 followers on Instagram, can reach the economies of scale beyond the business market. Thus, the goal of procurement is achieving cost economies at a target quality level when e-commerce has the purpose of production. However, that is not necessarily the case when the purpose is consumption. Therefore, although transaction costs are low, the necessary number of consumers to achieve scale may not be willing to participate – particularly in a high-end brand community.

Alternatively, consumers can come together in social shopping platforms that have the value offering for reducing prices through high-volume orders. Indeed, Groupon offers Riedel Cabernet/Merlot Glass set of two with a discount of more than 80%. The company reaches such a discount level, for a limited time and negotiated terms that are not guaranteed to offer the same value proposition again. Yet, this illustrates how easily a buyer, whether the wine-bar or consumer, can reduce the total costs for market exchange by incurring a small amount of transaction costs to join a platform. Thus, for product categories with a few manufacturers and many retailers, the cooperation on a platform can expand primary demand through cost efficiencies and through an increase in variety.

Therefore, TCE theory suggests that internalizing transactions are less costly, when (1) assets in use for the transaction are highly specialized, and (2) the transactions are recurrent, compared to market exchange which requires significant effort in monitoring or renegotiating contracts (Williamson, 1979).

Privacy and e-Commerce

Sensitivities about privacy risks from the unparalleled increase in the availability of unstructured data and the profiling incentives are likely to work in favor of buyers and sellers, in terms of brand equity that invest in technologies to protect their exchange parties.

For example, Apple Inc.'s strategic move to (a) integrate algorithms to block cross-site tracking cookies on its Safari browsers and (b) offer the functionality as a customization option to users, with an easy tick box, is a clear example. The strategy aligns with the principles motivating the European Union's General Data Protection Regulation (GDPR) and the California Consumer Privacy Act of 2018, later followed by Google LLC to block tracking cookies on its Chrome browsers, despite Google's revenue dependence on digital advertising that includes, but is not limited to, search engine advertising.

E-COMMERCE PURPOSES AND TYPES

e-Commerce can be conceptualized as a technology-enabled subset of commerce (which is the stance early studies adopted), or as a driver of innovations that replaces some of the assumptions for commerce, moving beyond existing types of organizations and business models. e-Commerce is a new type of commercial exchange that can encourage new business models and even organizations. Therefore, e-commerce is not

a subset of commerce, but becomes a radical innovation for commerce, offering higher 'customer need fulfillment per dollar' as specialized investments in the new technology accumulate (Chandy and Tellis 1998, Chandy, Prabhu and Antia 2003).

In e-commerce, governance, 'the means by which to infuse order, thereby to mitigate conflict and realize mutual gains' (Williamson and Ghani, 2012, p. 82), corresponds to business types, B2B, B2C and C2C, which can migrate from one position to another depending on whether the commercial purpose is for production or consumption. Furthermore, a platform operated by a benevolent firm or a collective that includes individuals and firms can offer a variety of price-making mechanisms to fit buyer-seller transactions, all the while aggregating and processing data from transactions and making that information available to all participants at highly credible levels of transparency to resolve reputation and demand uncertainty and improve the efficiency of the market, at least in theory.

Thus, Figure 13.2 illustrates retailers, suppliers, and manufacturers with respect to their e-commerce purposes. Market exchange can have the purpose of satisfying consumption needs or being derivative of those production needs. These needs increase in strength as individuals come together. There is no cost information embedded in Figure 13.2, but the arrows indicate how firms are likely to emerge as cost-efficient organizational forms to fulfill consumption and production needs of the market. Accordingly, in e-commerce, individuals and firms can reposition and participate or establish platforms that bring individuals or firms together. The classical commerce types, B2B and B2C, are observations of clusters due to inefficiencies in transaction costs, where the sharing economy introduced C2C on the map, which nevertheless provides the origins of market exchange.

As Figure 13.2 illustrates, buyers and sellers exchange goods and services for production or consumption. B2B and B2C are standard commerce types that describe

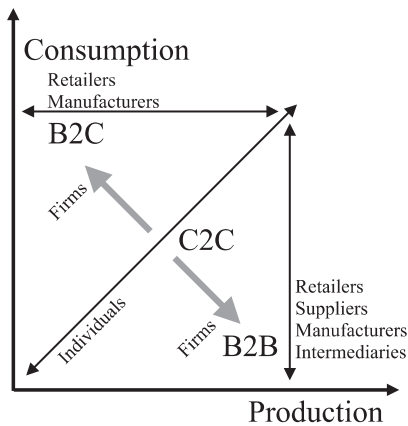


Figure 13.2 Dimensions of e-commerce purposes and types from a TCE perspective

transactions between firms for production, and between firms and consumers for consumption. C2C relationships varies from informal exchange to commercial exchange via platforms. Platforms can be designed to bring together B2B, B2C or C2C types of e-commerce.

The next sections consider different purposes of e-commerce and the primary types of e-commerce.

Consumer-to-Consumer (C2C) Commerce

Digitalized information and associated internet technologies initially offered self-expression benefits to internet users and have evolved towards greater interactivity, allowing consumers and firms to engage with content relevant to commercial activities (see Lamberton and Stephen, 2016). According to Lamberton and Stephen (2016), digital and social media provides individuals with an ability to form networks to generate and transfer information online.

For example, buying and selling second-hand goods on eBay is the archetype of C2C e-commerce. Nevertheless, operators

of platforms in the sharing economy do not require consumers to also be sellers. Thus, a seller on eBay does not need to be a buyer to operate on this system. Therefore, any interested firm can enter the market, making it less of a C2C (or peer to peer, P2P) type market exchange by definition.

Eckhardt et al. (2019) characterize the sharing economy as a system that delivers economic value by allowing consumers to expand their roles on a mediator platform to temporarily use a crowdsourced supply of products. Thus, an emergent exchange model in C2C, typically with services, specifies a time limit to offer access to goods. Sundararajan (2019) conceptualizes the sharing economy as a combination of market economies and gift economies, where the intimacy between participants plays an important role to reduce transactions costs. For example, small gifts are often provided by Airbnb hosts, some of whom enjoy socializing with their guests, and guests may enter the host's personal space as part of the experience (Sundararajan 2019).

Such temporary access to goods by other consumers on the platform impacts sellers in the value network, as well as retailers and manufacturers in different ways (Tian and Jiang, 2018), yet this has also welfare effects within consumer surplus (Fraiberger and Sundararajan, 2015). Fraiberger and Sundararajan's (2015) mathematical model of durable good ownership observes that when sharing/trading in secondary markets, the transaction costs are a major reason why consumers consider retaining their durable goods, only to offer access via the secondary market. One of the notable findings is that lower income participants access higher quality products, financed by revenues from the sharing economy.

In related research, Tian and Jiang (2018) focus on a subset of the sharing economy, where consumers temporarily exchange goods without any service provision. They focus on the demand implications for manufacturers and retailers, analyzing whether

consumer utilization of excess capacity of resources, such as products that have already been purchased, necessarily contract demand in the market, which is a concern for B2B markets, specifically, where consumers act as producers and thus increase competitive pressures on existing channels to appropriate the value generated through their coordinated efforts in the supply networks.

Tian and Jiang (2018) show that in the sharing economy manufacturers decrease or increase capacity levels, depending on the investment costs for capacity: Increasing (decrease) capacity, if capacity costs are high (low), affects supply levels to markets. Consumers' willingness to pay for the product is part of the mechanism that pushes retail and manufacturer prices upwards, due to expected rental fees that counters substitution effects from purchasing new products to renting them (Tian and Jiang, 2018). A critical parameter in Tian and Jiang's (2018) model is the transaction costs, to capture moral hazard issues applicable to offering temporary access while retaining ownership of these assets. They find that if transaction costs are low, the sharing economy can improve profitability of the entire channel, after reaching the capacity cost threshold where 'value enhancement effect' dominates price reduction pressures on retailers from higher utilization of consumer capacity.

These are transaction-specific investments to safeguard against behavioral uncertainty and reduce search costs for both buyers and sellers. Notably, online platforms that mediate transactions and trust among buyers and sellers in the sharing economy invest in technological assets that can accurately determine reputation and trustworthiness of parties and communicate that information with them (Sundararajan, 2019). For example, rating and review mechanisms of social media platforms that feed data into algorithms for improved personalization (Ansari et al., 2018; Chung et al., 2016) have the capability to improve the efficiency of trustworthiness

assessments of both buyers and sellers on these platforms.

Distributed ledger technologies, e.g., blockchain, has the potential to open hybrid governance modes that reorganize productive activities within and beyond firm boundaries, to include consumer groups, which can manufacture parts if they further coordinate to make capital investments. While on the surface that would contradict with what a consumer is, by definition, prosumers exactly achieve that, despite pressing transaction costs in background systems that enable them to join power grids (see Cova and Dalli, 2009; Hwang et al., 2017). Electricity is generated and distributed through much more complex networks, compared to value networks of manufactured goods. Thus, if prosumers can exchange their product in an electricity market, then categorizing their commerce as C2C would be an over-simplification. Peer to peer (P2P) is an alternative that recognizes the expanding consumer role in sharing economy. However, that does not distinguish whether the purpose of commerce is for production, e.g., of a semi-finished good, or consumption.

Business-to-Consumer (B2C) Commerce

Organizations have efficiency and effectiveness advantages in processing information, compared to individuals who engage in a market. Individuals come together in social, *epistemic communities*, as firms, to generate and use knowledge, that engage with each other to combine their knowledge and capabilities (Håkanson, 2010; Kogut and Zander, 1996).¹ A firm generates value from an effective integration of specialization efficiencies (Kogut and Zander, 1996) in producing knowledge and products, by utilizing know-how, raw materials, labor, and capital.

Commercial activities in omnichannel marketing revolve around information-processing

capabilities, gaining access to data and the ability to aggregate data from a variety of sources (Cui et al., 2021). Data is collected by various devices, e.g., smart watches, and is useful to firms to coordinate their marketing activities to offer smooth customer experiences. First-party cookies, engaging with buyers/sellers on social media platforms and investing in communication assets such as third-party e-commerce software integrations for custom-designed automated emails to remind customers of items left in online shopping carts, give an example for the variety. Among uses of data, designing metrics to measure progress towards marketing objectives (Järvinen and Karjaluoto, 2015) allow the firm to adjust its digital activities based on feedback from the market.

Customer lifetime value

One of the main goals that firms aim at is to increase customer engagement that has a direct impact on customer lifetime value (CLV), customer referral value, customer influencer value and customer knowledge value (Harrigan et al., 2015; Kumar, 2018). Customer lifetime value is a measure of the sum of expected revenue from a customer, which affects the cost of acquisition and the engagement types that are feasible for a particular customer. Yet, Kumar (2018) argues that the indirect value from social effects and co-creation opportunities are also relevant for a more accurate valuation. Customer referral and influence is value from acquiring new customers or expanding share of wallet from firm-initiated and customer-initiated communications respectively.

Customer Knowledge

Customer knowledge is also valuable to the firm in new product development and can be accessed by the firm, e.g., through online customer complaint forms or through social listening or via contests. Harrigan et al. (2015) find that marketing managers and

directors use social media as a source of information to personalize communication as part of their customer engagement initiatives, an approach that correlates with developing relational information, more than customer engagement performance with respect to competitors.

Customer Journeys and Firm Data Analytical Capabilities

Anderl et al. (2016) assert that data from a multitude of channels give a complex array to reach substantive inferences. Aggregating engagement data from customer journeys is necessary and useful. For example, an analysis of about 350,000 online customer journeys for a German online fashion retailer reveal significant positive interaction effects between firm-initiated communications and previous customer-initiated generic communications on conversion probabilities (Anderl et al., 2016). According to customer journeys in that sample, data about a prior search for a product by a customer helps to identify who to re-target and create personalized communications. However, the same insight may not be relevant to every other online retailer. Therefore, the analytical capability of a firm determines the scope of value that can be gained from increasingly complex online and offline customer journeys. For an online-only retailer, it is relatively more feasible to track without investments in automatic data recording tools in offline premises, e.g., radio frequency identification (RFID) technologies are valuable as they reduce ignorance of inventory errors in making replenishments and lower the frequency and costs of inventory audits, as theoretical models show (Lee and Özer, 2007).

Consumer Welfare and Stockouts

In earlier work, Brynjolfsson, Hu and Smith (2003, p. 1583) report an increase in consumer welfare and maintain that ‘transaction costs necessary to acquire ... in physical markets are prohibitively high.’ Through e-commerce, the long tail of the niche market has widened over

time, making rare books more available to the consumer market (Brynjolfsson, Hu and Smith, 2003, 2010). Nevertheless, the inventory stock-out is an issue in online shopping as well (Jing and Lewis, 2011). Work by Jing and Lewis (2011) investigated the purchase transactions of 2,283 buyers within an online retailer of nonperishable groceries, in particular the notion of ‘stockout,’ which they define as instances when customers do not receive the item they ordered. The study indicated that 25% of orders over 14 months had stockouts. Yet, estimates indicate a sharp nonlinear decrease of stockouts, between 15% to 20%, would improve profits and customer equity greatly. At 0% stockouts, the average CLV is estimated to improve by 56% (Jing and Lewis, 2011).

The role of smartphone applications and promotions in B2C e-commerce

One of the engagement drivers in B2C e-commerce is the smartphone applications of retailers. A segment of customers that only have physical engagement with retailers – who have previous interactions and a purchase history with the firm but have not made any purchase – are more likely to engage to make a purchase through mobile apps (Van Heerde, Dinner and Neslin, 2019). According to Van Heerde, Dinner and Neslin’s (2019) findings from modeling the shopping behaviors of 629 customers over 77 weeks, they identified when consumers downloaded the app (only iPhone brand smartphones) and how that affects their shopping across channels. Van Heerde et al. (2019) argue that evidence indicates an improvement in the digital engagement of customers, as the marginal effect is positive for all customers, and associate it with an increasing lift in purchase probability as consumer interaction on the app increases.

In the Van Heerde et al. (2019) study, offline advertisements significantly correlate with online purchase, yet that is not the case for online purchase. Furthermore, social media posts on Facebook and Twitter do not appear to affect app downloading decisions.

These findings are important to note (i) the interplay between online and offline channels in an integrated marketing mix approach considering customer experience and (ii) how being on social media or investing in online advertising does not necessarily translate into effective marketing. Rather, the quality of the communication, e.g., content design, and measurement (e.g., Kübler, Colicev and Pauwels, 2020) are some of the main considerations that require researchers’ attention.²

Colicev et al. (2018) report on the impact of earned and owned social media, which they measure with impressions, sentiments, and brand followers, on returns and idiosyncratic risk measures of firm value, in the NYSE and NASDAQ stock markets. The system modeling approach allows to distinguish between the dynamics from customer mindset metrics on brand awareness, customer satisfaction and purchase intent. While an improvement in both owned and earned-media have positive impacts on awareness and satisfaction measure, purchase intentions increase only for earned media (Colicev et al., 2018). This finding is consistent with recommendations to marketers to design their communications on firm-initiated channels to move customers to customer-initiated communications, and more from generic search or price comparison to branded search or direct type-in (Anderl et al., 2016).

Business-to-Business (B2B) Commerce

In a B2B setting, demand variations across time and geographies lead to environmental and behavioral uncertainties, even for regularly transacting partners. Demand shocks in a market result in stockouts that reduce customer goodwill or leftover inventories, which is mitigated via coordination contracts between buyers and sellers to achieve cost efficiencies (Lariviere, 1999). Without such costly modifications to contractual terms, not only the profitability is less than the optimal, but demand uncertainty also increases for other channel members.³

Demand forecasting, degree of transparency, company procedures for inventory targets and logistics, and misperceptions about feedbacks are some of the factors that further moderate demand uncertainty (Bhattacharya and Bandyopadhyay, 2011). Relational communication content and reputation of trustworthiness improve bargaining outcomes to transactions even in a simple dyad (Srivastava and Chakravarti, 2009).

In earlier research, Grewal, Chakravarty and Saini (2010) report a negative relationship between demand uncertainty and e-commerce performance, with survey data from a sample of 428 market makers in the United States. These market makers, including firms and platforms, develop and manage content, engage buyers and sellers to facilitate effective matching, record histories of transactions, classify buyers and sellers, determine reputation, establish pricing rules, and provide secondary services such as support and training.

From the TCE perspective, investments in specialized assets aiming at improving these information-based relational factors reduce the uncertainty and improve B2B performance (e.g., Grewal et al., 2010). These specialized assets are relational and technological investments to reduce the costs of transactions. Thus training that encourages salespeople to perform consultative selling (Cuevas, 2018), content specifically designed (Holliman and Rowley, 2014) to lower information search costs, digital tools for collaboration, e.g., a smartphone application developed by one of the trading parties (Gill, Sridhar and Grewal, 2017), or software developed by a third party, e.g., billergenie.com that integrates with accounting applications to remind due payments to buyers, blockchain-supported smart contracts (Roeck, Sternberg and Hoffman, 2020), RFID systems that mitigate information asymmetry (Lee and Özer, 2007) are examples of specialized assets enable transparency and relational value.

Professional selling capabilities in B2B commerce

The nature of professional selling has been changing (Cuevas, 2018). Salespeople must gain functional, relational, managerial, and cognitive competencies so that the organization can engage in transactional and consultative selling, depending on the occasion and the buyer needs, to reach ambidexterity in sales management (Cuevas, 2018). In social selling that benefits from the social networks and digital channels, salespeople are expected to understand, connect and engage with buyers in digital customer journey touch-points (Ancillai et al., 2019).

Maklan, Antonetti and Whitty (2017) offer a customer experience management framework that helped the Royal Bank of Scotland's commercial division to adopt a 'relationship service model' that both reduced the costs and increased revenues at about US\$25 million each, e.g., an estimated 40,000 calls per month were due to a lack of integration in processes. Furthermore, Maklan et al. (2017) report a revenue increase and a cost reduction of about US\$300 million each for the retail division as part of the same intervention study of the newly formed unit, Customer Experience and Service Definition Measurement and Costing, in the bank. The case study points to the importance of customer engagement in both B2B and B2C settings for a single company in UK.

Engagement in B2B commerce

From a relational standpoint, firms benefit from social media, in customer engagement and integrated communication with all audiences, which is useful to improve reputation, brand awareness, digitalize customer relationship management, increase a sense of belonging within the firm, and generate innovation opportunities (Cartwright, Liu and Raddats, 2021).

Brodie et al. (2019) argue that engagement happens in various interconnected networks, motivating the concept of *actor engagement* as more relevant to get a grasp of complex arrays of relationships on inter-related networks that include individuals and firms – not necessarily buyers and sellers of a dyadic perspective. Individuals engage in brand communities, innovation networks and in some collaborative networks with other individuals, that include employees of firms, non-profits etc., and volunteers.

Through formal or informal networks in *communities of practices* (Wenger, 1998) engagement happens over shared content – specific to philosophy and techniques of a profession. According to online interviews with marketing professionals, Holliman and Rowley (2014) find that managers consider help-oriented and shareable content more valuable, compared to selling-oriented content to benefit from inbound marketing through content. Furthermore, the costly investments of sellers in publishing helpful content indicates a better understanding of buyer needs and signals commitment of sellers, which mitigates behavioral uncertainty about the market exchange.

Unlike the transactional exchange, benefits from these performance improvements are realized in the longer term and are relatively more difficult when attributing sales to marketing activities. With a ‘difference in differences’ analysis of pre- and post-download engagement, Gill et al. (2017) identify the revenue impact of offering a free mobile application to a manufacturer of industrial materials. The manufacturer gained an increase of 20% in annual sales from customers who downloaded the mobile application. Furthermore, Gill et al. (2017) report positive yet diminishing returns with engagement levels, referred to as buyer *participation intensity*, on the mobile application. The economic benefits of free mobile applications offered by the seller to assist project development capabilities of buyers (Gill et al., 2017) is an example of a

specialized asset in production that reduces transaction costs in a B2B setting.

Another example from Herhausen et al. (2020), who examine B2B and B2C managers, finds that B2B managers are relatively comfortable with how well they use third-party e-commerce and two-sided platforms for purchasing, in terms of how well current capabilities fit future needs. Although the need to invest in selling on respective e-commerce platforms is somewhat more of a concern, the key areas of importance are systematic data collection and analysis, digital selling tools, and the use of social media and technology applications for digital customer relationships management (Herhausen et al., 2020).

Firms achieve interactivity of relations and real-time access to reliable information by investing in digital capabilities (Herhausen et al., 2020), and social selling (Ancillai et al., 2019). The benefits are observed in the utilization of the high bandwidth of information with video conferences (Hardwick and Anderson, 2019), an opportunity that e-commerce offers as an information processing advantage for firms in business markets. While brochures are less costly in terms of transfer of information compared to video conferencing, they are nevertheless not that interactive (Hardwick and Anderson, 2019). Through in-depth interviews with managers of biotech firms that engage in co-creating new products with buyers, Hardwick and Anderson (2019) find that video conferencing enables relationship-critical exchanges for social bonding. Sharing tacit knowledge and advising on technical problems and product use benefit from interactivity in video conferencing, which is highly valuable, particularly in a product development setting where uncertainty is at high levels.

In e-commerce, compared to traditional commerce, search costs are lower, particularly for niche products (Brynjolfsson, Hu and Smith, 2003). Although that is an advantage for the buyer to search for and acquire information about products and sellers in

the market, i.e., to reduce the information asymmetry on the buyer side, sellers are less likely to find information about buyer needs, unless through effective screening and smart engaging with prospective buyers. Geiger et al. (2012) report on the effect of relationship value and switching costs on relationship enhancement, tolerance, search for alternatives and switching intentions, with an extensive longitudinal multi-country survey (521 sellers and 373 buyers in Germany, South Korea, Argentina, and New Zealand). They find that investing in a more valuable relationship and raising switching costs positively correlate with relationship enhancement and tolerance. Plus, this is negatively associated with the search for alternatives and switching intentions. Interestingly, switching intentions are lower for higher levels of relationship value and switching costs for buyers, compared to sellers. Although buyers are in more advantageous positions (Marshall et al., 2012), when relationships are highly valuable and switching costs are in place, the search of alternatives decreases (Geiger et al., 2012).

CONCLUSION

This chapter offers a review of prior literature on e-commerce from the perspective of Williamson's transaction cost economics theory. Inherent uncertainty in the decoupling of purchase and delivery of the product, compensated by a value proposition that offers higher variety and greater geographic reach through e-commerce, provides the setting for the analysis. Transaction costs and uncertainty about the quality and delivery of product attenuate, as individuals and firms invest in specialized assets that the evolution in technology and marketing offers.

Traditional commerce types of B2B, B2C and C2C also evolve according to purposes of e-commerce, whether the goal is consumption or production of value. Firms or

individuals can reduce transaction costs by establishing and cooperating on a platform if that type of governance is technologically feasible as well. The second part of this chapter elaborates on interactivity and the role of data depending on classical commerce types in e-commerce analysis.

Although these standard commerce types are useful for analysis, the governance of exchange is evolving to accommodate dynamic engagements among interconnected networks of actors (e.g., Brodie et al., 2019) and facilitating emerging market exchange forms (e.g., Sundararajan, 2016). Production and consumption purposes provide the dimensions to analyze e-commerce types but are not necessarily the lines where B2B and B2C clusters appear, respectively. Efficiency gains from organizing within firms can be achieved by other forms of governance that are yet to emerge.

Costly production capabilities and efficiency gains from hierarchies and economies of scale bring complex products at affordable prices to markets, by means of reduced transaction costs through e-commerce. Therefore, e-commerce has the potential to address relevant sustainability issues as markets and technologies evolve. For example, e-commerce has the potential to expand the participation base from individuals who are employed by firms to all individuals through the sharing economy. Thus, this offers lower entry barriers to commercial exchange which results in democratizing markets (Sundararajan, 2016).

Furthermore, connected consumers (see Wuyts et al., 2011) participate in e-commerce more efficiently. There is evidence that platform cooperatives coordinate labor more effectively for more effort and product quality improvements, which are achieved through network externalities. Thus, the value offer increases with network size (see Belloc, 2019). These advances in modes of production and consumption are relevant to e-commerce, which can be used to reduce transaction costs to mitigate uncertainties

Table 13.2 Specialized assets and traditional types of e-commerce

<i>B2B</i>		<i>B2C</i>		<i>C2C</i>	
<i>Seller-side</i>	<i>Buyer-side</i>	<i>Seller-side</i>	<i>Buyer-side</i>	<i>Seller-side</i>	<i>Buyer-side</i>
Investments in technological assets to communicate real-time, e.g., Slack Connect, automatize contracts, e.g., Zapier, improve coordination efficiency, e.g., Salesforce, for competitor tracking, e.g., Prisync, and social listening for business accounts, Brand24	Investments in assets for inventory management, e.g., radio frequency identification (RFID) beacons, Internet of Things (IoT) devices, software as a service (SaaS) that uses machine learning in electronic resource planning (ERP) and finance processes, e.g., Gatekeeper, and distributed ledgers, e.g., IBM Blockchain	Investments in the infrastructure to deliver customer experience and actor engagement synchronized across devices in online and offline locations, e.g., push notifications to smart watches	Investments in devices, e.g., Oculus, online payment systems, e.g., PayPal, in firm owned mobile applications and in user profiles for marketplaces, e.g., Amazon and in subscription services for information goods, e.g., NYTimes or for experience goods, e.g., Disney+	Investments in online marketplaces e.g., eBay, in applications for task management, e.g., Trello, in online communities, e.g., Reddit, in productive devices and software, e.g., Adobe Photoshop, in training courses, e.g., Masterclass, and in data processing capacity	Investments of time and data in online communities, e.g., Quora spaces, and develop skills in games to access new purchase opportunities, e.g., Fortnite
Importer discovery platforms, e.g., TradeAtlas, or for digital products, e.g., Gartner Digital Markets	SaaS management platforms to coordinate various inventory control and logistics applications e.g., Zylo	Product discovery platforms, e.g., rangeme.com for CPG retail, return management platforms, e.g., 12Return	Investments in social shopping applications, e.g., Groupon, in discovery applications, e.g., Foursquare, in delivery applications, e.g., Deliveroo, Getir	Investments in personalized communications with customers, e.g., Instagram direct messaging	Investments in pro-social behaviors in sharing platforms to build reputation, e.g., Airbnb

Investments to reduce adaptation costs are on the upper row and investments to reduce behavioral uncertainty are in the lower row

from macro factors, such as the climate change, habitat effects and immigration, among many others.

On the other hand, developments in e-commerce appear with their own ethical concerns about the privacy of user data (Stead and Gilbert, 2001), the carbon footprint of blockchains and the design of algorithms

(Hawlitschek et al., 2018). Competition on delivery periods, to offer a same-day or next-day service as a subscription service, potentially feeds back into cultural norms as consumers are unlikely to opt for delaying their deliveries.

Overall, the information asymmetry between buyers and sellers in e-commerce

varies according to the nature of the product and whether the purpose is production or consumption. The distinctions between digital (e.g., information products such as books) and physical products (e.g., clothing), and between B2B, B2C, C2C, are traditional demarcations for commerce typologies. While B2B and B2C are two of the major commerce types, C2C appears to be less profit focused, more human needs oriented, and has been on the rise as it recognizes the social nature of human societies (Sundararajan, 2019). e-Commerce extensively benefits from specialized assets that mitigate uncertainty and aim for recurrent transactions, since one of the strengths of e-commerce is data collection and processing capabilities to instill more efficient relational governance of transactions compared to classical contracting. As a solution space, where previously vertical and horizontal boundaries were feasible, characterized by B2B and B2C exchange, interior areas are increasingly available, hosting platforms for production and consumption, as in the sharing economy.

In summary, the digitalization of commerce reduces frictions and inefficiencies in the market exchange. Thus e-commerce is an efficiency enhanced commerce and not a subset of it, despite its early treatments in the marketing literature as a valuable additional distribution channel with potential channel conflict implications (e.g., Geyskens, Gielens and Dekimpe, 2002). Instead, e-commerce has proved to be a domain that drives innovations in place, product, price, and promotions to achieve integrated marketing programs.

Future Research

An implicit assumption is that e-commerce is part of a channel management topic related to disintermediation and omnichannel marketing. However, the increased strategic dependence of product, price, place, and promotions on digital technologies and the use of data-driven decision making allows

integrated marketing programs to be the norm in the marketing mix, not some utopian goal to impose on the traditional 'offline-only' commerce, which is a topic that could be explored further.

One cannot think about the future of e-commerce independently of the future of the planet. Costs of production and consumption must include assessments of the impact on the environment in further specificity. Reductions in transaction costs from digitalization of commerce expand the solution space to benefit from synergies in production and consumption activities of individuals and their informal (e.g., communities) and formal networks (e.g., firms). Increasing network sizes and connectedness increases the size of network externalities that affect the efficiency of consumption and its impact on production. Interactivity of actors and real-time availability, along with transparency of data, offers greater returns to appropriating value from such network externalities in production and consumption. These are areas of e-commerce are worthy of further investigation.

Notes

1. Heimann and Nickerson (2002) offer an analysis that considers transaction cost economics and knowledge-based views as complementary, in contrast to confrontations between a resource-based view of the firm and transaction cost economics based on conceptualizations in the literature (e.g., Williamson, 1999). The information asymmetries within the firm across employees and between employee and managers have efficiency implications (Foss and Foss, 2008).
2. Kübler et al. (2020) find that social media volume of engagement metrics associate with brand awareness and purchase intentions, whereas sentiment analysis is preferable for recommendations and satisfaction metrics.
3. In an analysis of B2B inefficiencies, between firms and advertising agencies, Gordon et al. (2021, p. 84) note 'contracting problems have received limited attention in the specific context of digital advertising markets' and discuss moral hazard issues, e.g., agencies' cost minimizing by pooling competing clients, and in a particularly complex value network that includes advertising agencies,

publishers, demand and supply side platforms, data management platforms and numerous third parties. These intermediaries substantiate information asymmetry in contracting with the margins that incentivize moral hazard and therefore lower returns to the buyer in that exchange. The uncertainty about the advertising effectiveness and difficulty of measurement is entirely consistent with the detailed transaction cost analysis here.

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