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Julia A. FEHRER

Sabine BENOIT
Singapore Management University, sbenoit@smu.edu.sg

Lerzan AKSOY

Thomas L. BAKER

Simon J. BELL

See next page for additional authors

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Julia A. Fehrer
The University of Auckland Business School, New Zealand
University of Bayreuth, Germany

Sabine Benoit
University of Surrey, Surrey Business School, UK

Lerzan Aksoy
Gabelli School of Business, Fordham University, New York, USA

Thomas L. Baker
University of Alabama, Tuscaloosa, USA

Simon J. Bell
University of Melbourne, Australia

Roderick J. Brodie
The University of Auckland Business School, New Zealand

Malliga Marimuthu
La Trobe University, Melbourne, Australia

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Abstract

Purpose The collaborative economy (CE), and within it, collaborative consumption (CC) has become a central element of the global economy and has substantially disrupted service markets (e.g., accommodation and individual transportation). The purpose of this paper is to explore the trends and develop future scenarios for market structures in the CE. This allows service providers and public policy makers to better prepare for potential future disruption.

Design/methodology/approach Thought experiments – theoretically grounded in Population Ecology (PE) – are used to extrapolate future scenarios beyond the boundaries of existing observations.

Findings The patterns suggested by population ecology forecast developmental trajectories of CE leading to one of the following three future scenarios of market structures: the centrally orchestrated CE, the social bubbles CE and the decentralized autonomous CE.

Research limitations The purpose of this research was to create CE future scenarios in 2050 to stretch one's consideration of possible futures. What unfolds in the next decade and beyond could be similar, a variation of, or entirely different than those described.

Social implications Public policy makers need to consider how regulations – often designed for a time when existing technologies were inconceivable – can remain relevant for the developing collaborative economy. This research reveals challenges including distribution of power, insularity and social compensation mechanisms that need consideration across states and national borders.

Originality This research tests the robustness of assumptions used today for significant, plausible market changes in the future. It provides considerable value in exploring challenges for public policy given the broad societal, economic, and political implications of the present market predictions.

Keywords: Collaborative consumption, thought experiments, platform economy, social bubbles, decentralized autonomous economy

Paper type: Conceptual paper

Introduction

Within a short period, the collaborative economy (CE) and within it collaborative consumption (CC) has become a central element of the global economy with growth estimated from $15 billion in 2013 to $335 billion by 2025 (PWC, 2014). This growth has brought with it a corresponding increase in interest from both academics and practitioners (Kumar *et al.*, 2017). The CE reflects the broad transition of the economic landscape, where existing markets are being disrupted due to increasing engagement, connectivity and social interaction among actors. CC refers to an economic and cultural model of organized sharing, bartering, lending, trading, renting, gifting, and swapping (Botsman and Rogers, 2010a) – a model where the ownership of goods is often replaced by temporary access to goods owned by peers (Belk, 2014). It is built on distributed power and trust within communities as opposed to the centralized power of focal firms, blurring lines between customers and service providers (Botsman and Rogers, 2010b; Benoit *et al.*, 2017a). A wide range of industries including entertainment (e.g., file sharing), food (e.g., communal gardens), labor market (e.g., freelancer exchange) and transportation (e.g., peer-to-peer car sharing) have been impacted by this new socioeconomic model of exchange (Hartl *et al.*, 2016). In the near future, CC will likely lead to disruption of additional industries.

The disruptive power of CC comes from three distinct characteristics about how peers (i.e., customers and service providers) engage and connect with one another: nature and type of actors, nature of exchange, and directness of exchange. First, Breidbach and Brodie (2017) emphasize the central role of engagement platforms (i.e., virtual and physical touch points to connect various actors) leading to a new constellation of actors in CC. Traditional dyadic firm-to-customer interactions are replaced by triadic interactions between a platform provider, a peer service provider and a customer (Benoit *et al.* 2017). Second, CC changes the nature of exchange from

usage based on ownership to usage as a function of access (e.g., personal transportation not occurring via car ownership but rather via having access to someone who does). Third, CC differs regarding the directness of exchange in that CC is enabled through a platform (indirectly) providing the infrastructure and rules for exchange, and thus differs from traditional modes of exchange (e.g., direct exchanges between firms and customers) and purely social mechanisms (i.e., sharing among family and friends). CC defined by these three characteristics forms a new *collaborative market structure – the collaborative economy* – where traditional roles of firms, employees, competitors, shareholders, and customers change and where the value is co-created based on engagement processes among different actor groups (e.g., between customers and service providers)

The purpose of this paper is to explore *the possible nature of future collaborative market structures* driving *collaborative consumption*. It is suggested, that contemporary business environments are facing the next digital revolution, one that will be marked by *high degrees of connectivity*, *ubiquitous technology*, *peer-to-peer engagement* and *open access to knowledge and resources* of various other actors (World Economic Forum, 2016). These trends will impact the future market and organizational structures and accelerate the evolution of CC.

Thus, the overall contribution of this paper is the development of scenarios that describe extreme dichotomies and as such span the space of *potential future realities of collaborative consumption in 2050.* The research approach is theoretically grounded in *population ecology* (Hannan and Freenan, 1977) and methodologically supported with *thought experiments*. Population ecology (PE) is well suited since it provides growth, competition, and survival patterns for the development of markets. To theorize about developments of future market structures driving CC, thought experiments are particularly useful. The methodology allows for extrapolating

beyond the boundaries of existing observations of market structures to future scenarios while referring to significant trends in CC. These future scenarios are carefully constructed and theoretically grounded snapshots, reflecting possible ways of how market structures around CC may develop (Saritas and Nugroho, 2012).

The result of the PE informed thought experiments are *three future scenarios of the CE*. Scenario 1 represents a *centrally orchestrated CE,* where actors are connected by few powerful platform providers. Scenario 2 depicts a *social bubbles CE,* where individuals only collaborate within their social circle usually with others who think and act alike. Scenario 3 illustrates a *decentralized autonomous CE,* which is a web of open collaboration, in which collectives of individual actors can self-organize around shared goals and values.

This paper will be presented in the following manner. First, an overview of PE is presented to provide the theoretical framing for the evolution of the future market and organizational structures. Second, thought experiments based on four market trends are discussed that drive the development and growth level of CC and will likely play the most significant role in the future evolution of CC. In the third section, three future scenarios for the evolution of CC are developed based on systematically combining the main trends with the central concepts of PE. Finally, the theoretical advances and future research directions concerning the nature of the future market and organizational structures enabling CC are discussed.

Evolution of systems from a Population Ecology perspective

Population ecology (PE) aids in understanding the conditions under which organizations emerge, grow, and cease to exist (Hannan and Freenan, 1977). A population is considered as "organizations engaged in similar activities and with similar patterns of resources utilization,"

whereas "organizational communities are functionally integrated systems of interacting populations" (Baum, 1996, p. 77). PE thus accounts for influences at *multiple levels – organizations (e.g., Airbnb), populations* (i.e., the CE), and *organizational communities* (i.e., CE companies and their competitors. As such PE also explains how market structures evolve. PEs ability to explain developmental trajectories of market structures makes it particularly useful for this research.

PE differentiates between two strategies that allow survival under various environmental circumstances: r-strategy and K-strategy (Javalgi and Scherer, 2005). In the growth phase of a market, organizational mortality is usually high. At the same time resources are typically plentiful and competitors can grow without taking market share from each and thus competition is relatively lax. Under those conditions, most organizations will be r-strategists that are outward/market focussed on "reproduction" of resources (e.g., customer acquisition). In contrast, in mature markets that become more constant and predictable, organizational mortality is low, competition is fierce, and companies grow by taking market share from competitors. Most organizations in this phase are K-strategist which are more inward focused and aim to improve efficiencies and thus the better use of existing resources rather than seeking growth (Javalgi and Scherer, 2005).

PE further differentiates between two different kinds of organizations: generalists and specialists (Baum, 1996; Noy, 2010), which is related to the concept of *resource partitioning* (Carroll, 1985). *Generalists* depend on a large variety of resources, target average customer preferences, and as such occupy the middle of the market. This allows them to survive in large environmental spaces and exhibit adaptive tolerance for more widely varying environmental conditions (Carroll, 1985; Noy, 2010). In contrast, *specialists* require a specific environmental condition (niche) or specific environmental resources to survive and thus concentrate on a

particular market segment. They usually possess fewer slack resources and because of their specialization are therefore less able to adapt to changing market conditions (Noy, 2010; Carroll, 1985). Since generalists compete in many segments, they are usually larger than specialists (Carroll 1985). Resource partitioning means that “resources left over by the generalists are most likely to be absorbed by the specialists” (Carroll, 1985, p. 1272) or seen from the perspective of the organization, specialists “concentrate their resources on the market space not covered by the generalist to avoid direct competition” (Noy, 2010, p. 80). Resource partitioning, therefore, can lead to a market equilibrium in which both generalist and specialist operate in distinct resource spaces and as such their relationship becomes symbiotic rather than competitive (Carroll, 1985).

Competitive Environment and Strategic Direction

r-Strategist: focused on reproduction of resources (outward orientation), i.e. customer acquisition, dominant strategy in growing markets

K-Strategist: focused on efficient use of of resources (inward orientation), i.e. production process, dominant strategy in mature markets

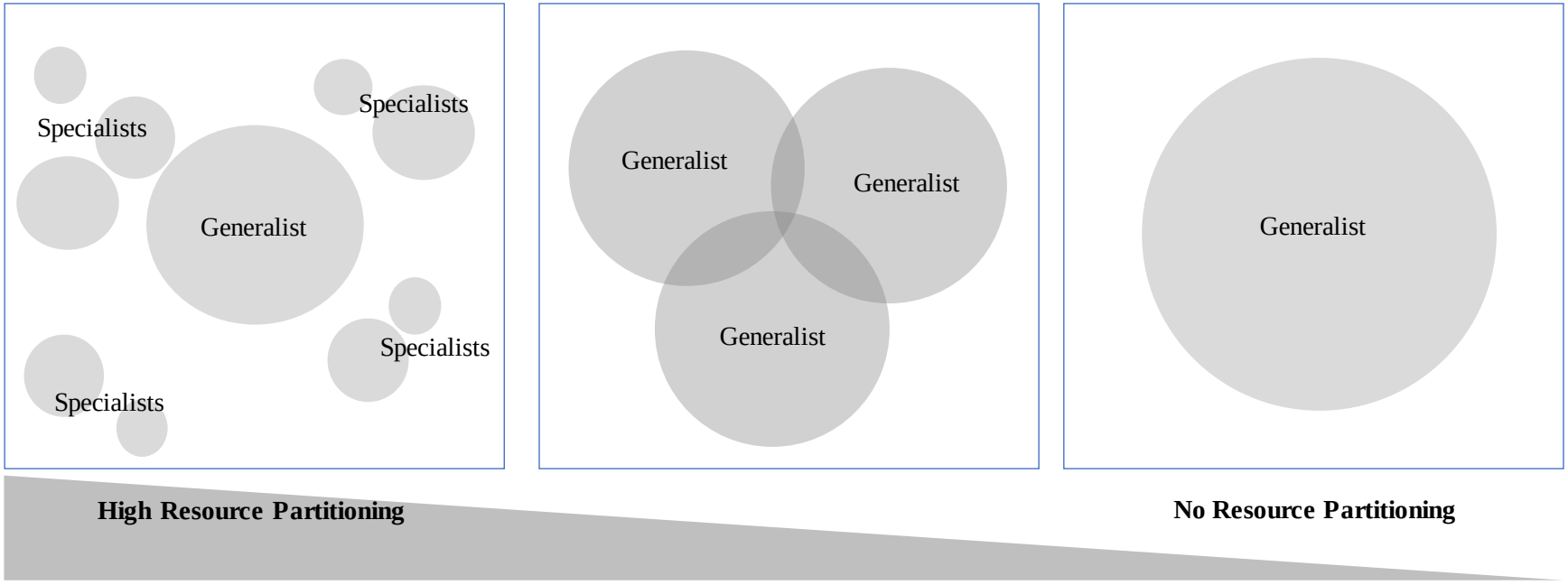

Figure 1: Population Ecology Model of Strategic Directions and Resource Partitioning

While the market equilibrium can be disrupted by a variety of factors, three are most relevant in the present study: 1) entrepreneurial decisions, 2) technology affecting an organizations' competencies and 3) technology affecting the availability of market resources. The entrepreneurial first-mover is often a specialist at first that will over time aim to widen the scope of the business and then become a larger generalist (Todd *et al.*, 2014). Thus, a smaller specialist moving into the space of a larger generalist, something usually triggered by limited growth potential in the specialist niche. On the other hand, the niche of the specialist can become so attractive that entrants – amongst them, potentially larger generalists – move into (Noy, 2010). Both movements will disrupt the equilibrium and lead to changes in market structures. For example, ten years ago the market for individual transportation (organizational community) was mainly populated by one type of organization (population), which were taxi companies (generalists). In 2010/2011 Uber entered the market offering individual peer-to-peer transportation. In line with theoretical predictions, this former specialist targeting a niche (peer-to-peer) has continuously moved into the space of the generalist market. In this case, it was with Uber Black offering an elevated driving experience with professional drivers and high-end cars.

The second factor that can disrupt market structures is technology and its impact on organizational competencies. PE argues that technological evolution can be seen as a process of creative destruction that happens either gradually or radically (Baum, 1996) and that has a significant impact on the competitive environment (Todd *et al.*, 2014). For the individual organization technology discontinuities can be either *competence enhancing* or *competence destroying*, meaning that the new technology is either strengthening or weakening the competitive position by making competencies obsolete (Tushman and Anderson, 1986). On the level of the population and organizational community, such technology discontinuities enhance competition

since organizations with superior technology will replace organizations with inferior technology (Tushman and Anderson, 1986). At the same time, PE has shown that over time organizational inertia constrains firms' abilities to embrace new technology (Baum, 1996), which seems particularly relevant for monopolistic markets in which targeting specialised market segments (e.g., tech-savvy) is not efficient (Carroll, 1985). This pattern is also apparent in the CE where the technology of ordering a car via an app or providing car location tracking for waiting time estimation or route monitoring would have been available to existing taxi companies in the market before Uber's entry. However, organizational inertia and, in many countries, the monopolistic market led to taxi companies assuming the market equilibrium was stable leading them to ignore this technology.

Finally, technology can disrupt markets by leading to a change in *resource availability* or what PE refers to as carrying capacity (see Figure 2) (Delacroix and Carroll, 1983). C*arrying capacity* is the limit at which the market can no longer grow because all resources are in use. Advances in technology and other structural factors can impact the carrying capacity of a market (Todd *et al.*, 2014) and that means the carrying capacity usually gets larger, for example through better ways of targeting, offering to customers, and producing more efficiently. Again, from a CE perspective, changing technology and peer-to-peer service exchange has vastly enhanced the carrying capacity on both "sides" of the market. First, an increase has occurred on the supply side by allowing customers to offer their unused assets to others (e.g., their flat through Airbnb). However, the demand side has also been impacted since peer-to-peer service exchange has changed the ability for customers with limited resources to gain access to products and services, which are usually cheaper (Benoit *et al.*, 2017b).

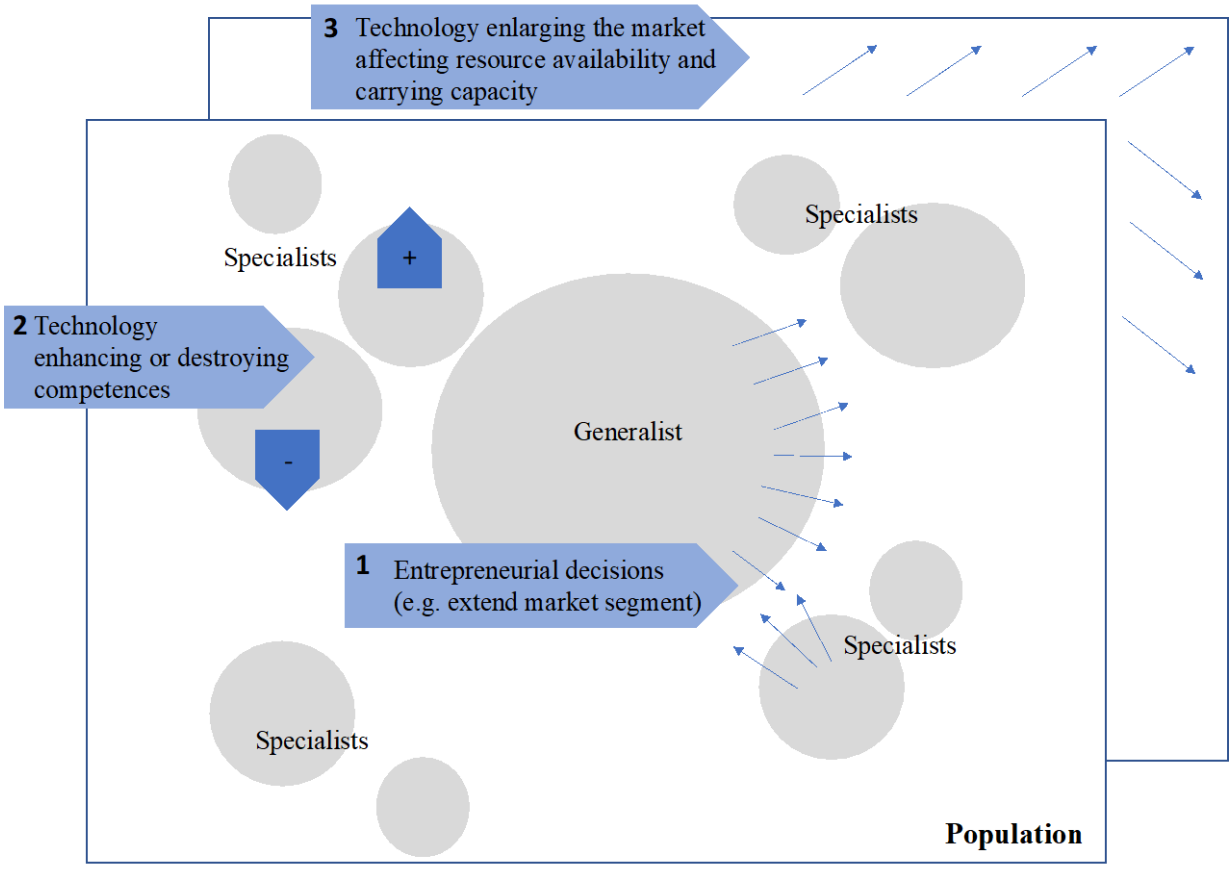

Figure 2: Forces of Disruption of a Population

Methodological approach

As noted previously, in a relatively short time CC has become an important and growing element of the global economy. Four trends have played an important role in this growth and will continue to drive the growth and evolution of CC. First, connectivity of actors on various layers – (a) individuals amongst themselves, (b) between individuals and devices, (c) devices amongst themselves and (d) individuals and their devices within a wider ecosystem of actors (e.g., governments and their infrastructure) – is central to the future development of CC. Second, customer engagement reflects an increasingly important process for value co-creation in customer-firm and peer-to-peer relationships. Third, a reduction in the role of possessions related to human

identity formation can be observed, which has subsequently led to the commercialization of ownership. Fourth, the development of new technology and artificial intelligence in particular, is highly relevant for the future of the CE since technology supports and actively influences actors – customers, service providers, and platforms – in their interactions, for example through smart devices and cyber-physical systems.

Based on the theoretical foundations of PE, these *four main trends impacting the CE* will *be extrapolated using thought experiments* to develop extreme scenarios of potential CE futures. Thought experiments entail posing a number of 'what if' questions to imagine possible worlds (Cooper, 2005). They make use of the fact that instinctive knowledge is inferential (Sorensen, 2010). The following exemplified trends build the basis for the "what if" questions in that they were extrapolated into extremes, e.g., "what if actors (i.e., customers and service providers) were connected by a blockchain as opposed to a proprietary platform? or "what if actors organize themselves based on engagement practices as opposed to being centrally governed by an engagement platform?" or "what if ownerships in the CE were to become entirely commercial"? or "what if technology, artificial intelligence in particular has agency in service ecosystems"? The answers to these questions are deduced from PE in rigorously applying the mechanisms exemplified in the theory section. Along with recommendations in the literature on thought experiments the answers to the "what if" questions are synthesized in a model which represents how imaginary entities would behave (Cooper, 2005). In the present research, the results of the thought experiments are three scenarios, representing extreme cases that span the space of potential future realities. Thus, they do not represent a description of a realistic future reality. Rather, we expect future CE situations to *approximate*, or approach, one of the scenarios. This is in line with recommendations on how to best use thought experiments. In other words, we are more concerned

with the implications of extreme cases than whether these scenarios are realistic. Indeed, Nordmann (2005, p. 107) states that extrapolation might lead to the absurdity that brings the "reader to enter the experimental mode." He even draws the analogy of thought experiments to a theatrical rehearsal to try out things that are then subject to scrutiny and criticism (Nordmann, 2005). What follows are the four trends impacting the CE; each will be explored in more detail to set the stage for the thought experiments that shape the future CE scenarios.

Trend 1: Increased Connectivity

As Belk (2014, p. 1595) points out: "Sharing is a phenomenon as old as humankind, while collaborative consumption [... is a phenomenon…] of the Internet age." The business model behind CC builds on digital platforms enabling connectivity amongst actors (Lawson *et al.*, 2016). Peer-to-peer connectivity allows platform providers to create positive direct and indirect network effects (Katz and Shapiro, 1985). Direct network effects explain the positive effects through more actors being connected (e.g., buying a smartphone provides value only if other people use smartphones as well). Indirect network effects refer to value creation based on the diffusion of a certain (technological) standard (e.g., Apple iOS). The higher the diffusion of this standard, the more services and applications will be provided that are compatible with it (Farrell and Saloner, 1985; Bonaccorsi *et al.*, 2006; Fehrer *et al.*, 2018). Network effects lead to increased connectivity which in itself lead to a higher level of density in the connections between actors, further resulting in new structures of social and transactional exchange. Individuals share their property (e.g., home-sharing), valuable possessions (e.g., ride-sharing or boat-sharing), their financial assets (e.g., crowdfunding) and their capacity to work (e.g., freelancer services) with other individuals, they have never met before and trust becomes central for their decision to connect (Key, 2017).

The rapid development of digital technology accelerates connectivity and enables the growth of what can be termed social cyber-physical systems. These systems can be understood as structurally and functionally open and context-sensitive. They enable communication with and among billions of devices such as smartphones, wearables, and other smart things connected via the internet (Horváth, 2014). The structural openness aspect means that these systems may create unprecedented scale (Yao and Lin, 2016). Functional openness implies they may consist of units (i.e., devices, humans, networks) that may enter or leave the collective at any time. Thus, social cyber-physical systems consider actors and their social contexts and adapt themselves towards an optimal symbiosis between the digital and the physical world (Horváth, 2014). Digital platforms reduce transaction costs when actors share their resources allowing interactions to become more efficient, but also more effective (Kumar and van Dissel, 1996). Embedded in social cyber-physical systems, digital technology expands scope and size of connectivity among humans, between humans and their smart devices and among smart devices (Kumar *et al.*, 2017), of which it is estimated there will be more than a trillion within the next few years (World Economic Forum, 2016).

Aiding this is the development of blockchain technology that creates a neutral authority for transactions. One characteristic of blockchains is that each actor has access to the entire database and its complete history, meaning that every actor can verify the records of its transaction partners directly (Iansiti and Lakhani, 2017). Thus, a variety of contracts or transactions can be managed without having intermediaries (lawyers, brokers, bankers, or government) involved. Smart contracts are embedded in digital codes and stored in transparent, shared databases. Every payment has a digital record and signature that can be identified, validated, stored and shared. Individuals, organizations, smart devices, and algorithms can freely transact and interact with one another with

little friction (Iansiti and Lakhani, 2017). Reducing the need for intermediaries, the number of direct connections per actor increases.

Increasing the density of direct connections is particularly relevant to CC where connectivity goes beyond traditional dyadic encounters between service providers and customers to include additional actors such as service platforms, cities, governments and/or interest groups (Mair and Reischauer, 2017). Connectivity in CC influences market structures globally in a wide range of economies (Sundararajan, 2016). New global and local market structures are formed, for example, the Food Assembly, a food-sharing market in France, connects local farmers with local food enthusiasts that value fresh, organic food from their region on a global platform (Mair and Reischauer, 2017).

In summary, it is suggested one trend that has led to the development of CC and will continue to exert a strong influence on its development is the enhanced degree of connectivity required for operating in the CE. Technological advances (e.g., the emergence of social cyber-physical systems) reduce coordination costs, push market scale and reduce market inefficiencies that have existed before this point.

Trend 2: Increased engagement

Customer engagement has emerged in the past decade as a critical process to understand value co-creation mechanisms between customers and service providers (Brodie *et al.*, 2011). Central to the engagement process is the active role of customers as resource integrators (Hollebeek *et al*., 2016). Prior to the initial publications utilizing the term "customer engagement" (e.g., Bowden, 2009; Brodie *et al.*, 2011; van Doorn *et al.*, 2010) the phenomenon of the "active customer" was studied using related concepts, including customers as partial employees, customer

participation or collaborative value creation (e.g., Bendapudi and Leone, 2003; Bowen, 1986; Moeller *et al.*, 2013). More recently, the understanding of engagement has evolved towards an integrative process perspective, which highlights not only the behavioral dimension of engagement (van Doorn *et al*., 2010) and the disposition to engage (Brodie *et al*., 2011; Chandler and Lusch, 2015), but also the extent to which network relationships (i.e. the connectedness with other actors) influence each other in the engagement process (Storbacka *et al.*, 2016; Kumar and Pansari, 2016; Chandler and Lusch, 2015; Brodie *et al.*, 2018).

CC is significantly influenced by, and dependent on, the engagement of versatile actors co-creating service and service experiences. Platform providers (e.g., Airbnb corporation) rely on the engagement of their peer service providers (hosts) and customers (guests). By engaging in reciprocal review processes (i.e., guests are reviewing the activity of hosts and vice versa), service quality can be assured with no gatekeepers (i.e., employees controlling service quality) being involved.

Thus, engagement creates trust and represents a central process for governing interactions in platform business models and decentralized systems – such as blockchains (Fehrer *et al.*, 2018). In other words, engagement reflects a central governance mechanism in the CE to assure service quality within the network.

Trend 3: Increased commercialization of ownership

It has been long recognized that customers often identify with their possessions and use possessions to display one's self and one's identity (Belk, 1988; Richins, 1994). More recent research has suggested CC and the mere access to goods can play the same identity forming function that ownership does (Belk, 2013). Taking this further we suggest that possessions will

gradually lose their importance for expressing one's identity, which is a trend that will shape the evolution of CC. The reduced importance of ownership will have a great influence on the demand side of CC as customers leverage the potential of other peers' unused goods with potentially favorable ecological or economic consequences (Benoit *et al.*, 2017b). For example, Moeller and Wittkowski (2010) found that more trend-oriented customers are more likely to prefer CC indicating that mere *access* to products signals one's trend orientation, i.e., identity (Belk, 2013). Thus, if access and ownership do not differ much in their effects on the individual's identity (Belk, 2013) the lower costs for access compared with ownership usually make CC the more favorable option, further accelerating the CE.

The decreasing importance of ownership also influences the supply side. One of the central motivations for peer service providers to get involved in CC is to obtain and co-create value from untapped potential residing in their goods (Benoit *et al.*, 2017b; Matzler *et al.*, 2015). Therefore, it can be argued that for many active peer service providers, "unshared" ownership of their possessions has either never had, or is gradually losing its, importance. This is being driven in part by the trend that possessions, in general, are less important with regard to identity formation but derives from the fact that CC provides actors the opportunity to commercialize their owned assets to generate income. For example, a recent study by Earnest blog (2018) reported the average monthly income for an Airbnb host is $924, something that has led to what the media has referred to as "the rise of the professional Airbnb investor." Furthermore, research has shown that even though only six percent of Airbnb hosts in New York offer more than two properties, something that would characterize them as a professional investor, this six percent generate approximately one-third of the bookings and revenue (PennState University, 2016). The fact that we see customers become more involved in giving others access to their slack assets such as cars (Uber,

Lyft), homes/rooms (Airbnb) or financial assets (Kickstarter) that can be used in CC is suggestive that the identity-forming function of ownership is decreasing.

In summary, we suggest that the ownership is losing its importance for identifying the formation of individuals, which fuels the demand and the supply side of CC. On the demand side more customers will make use of goods through CC to form their identities, and on the supply side, fewer individuals will perceive barriers to share their goods through CC.

Trend 4: Increased agency of technology

As technology has continued to advance, the term "robotics" has come to refer to hardware and "artificial intelligence" (AI) to refer to the intelligence of this hardware (Huang and Rust, 2018). AI included in some hardware refers to "intelligence agents" defined as devices that perceive their environment and take actions designed to maximize their chance of achieving specific goals (Poole *et al.*, 1998). More commonly, AI refers to machines that can, in some way, mimic the way humans think and act. AI is disrupting a broad range of sectors by allowing humans and machines to engage and connect with their environment in a completely new way (World Economic Forum, 2016).

AI enabled devices have had and will continue to play a central role in forward-thinking customer experience in CC, especially when it comes to serving customers in real time (Wirtz *et al.*, 2018). Devices like Amazon Echo allow customers to communicate with an artificial assistant that coordinates all of their data on the back end to better respond to their needs; similar technology (e.g., humanoid chatbots like Anna from IKEA) is being developed for a wide variety of companies supporting customers during their service experience. Further, AI enabled devices to allow human

service offerings to be enhanced by devices (e.g., google glasses, wearables) to create greater efficiency for faster and more consistently replicable services (Ng and Wakenshaw, 2017).

As discussed by Huang and Rust (2018) four types of intelligence are required for service tasks – mechanical, analytical, intuitive, and empathetic. Thus, from a service perspective, the incorporation of AI in robots is expected. AI-enhanced robots that are equipped with intelligence can collaborate and build up relationships with humans and also learn and adapt based on experience (Huang and Rust, 2018). As AI leads to enhanced social reasoning and relationships by robots, the next generation of robots can be expected to become more integrated into daily life and be helpful, pro-social partners (Čaić *et al.*, 2018). Such intelligent robots may open the doors to a new service era of human-style customer experience (Bolton *et al.*, 2018), that may be utilized across a wide range of industries - including Automotive, Financial Services & Banking, Healthcare, Media, Software, and Technology. At the same time, these intelligent robots will then take agency, i.e., make decisions independently.

AI can further create trust. Getting into a stranger's car, staying in another's home, allowing someone you don't know to take care of the dog, all require a willingness to be vulnerable to the actions of another. Through learning algorithms and collective intelligence, fraud or service failures can be detected, before they happen. AI produces reliable results free from human interference and thus is highly scalable. It can be used to protect against online review manipulation, data misuse, and identify theft/appropriation, to anticipate customer's and service provider's needs, match customers with service providers and other actors. As such AI provides 'safeguard-mechanisms,' protecting customers and service providers from bad experiences and uncomfortable situations, but at the same time technology makes the judgment about the trustworthiness of another actor and therefore takes agency.

To summarize, how AI enabled devices will impact CC is still being determined in part because the full implications have yet to be discovered. Regardless, given the ability of AI to "learn" how to engage with other actors in the system, it is likely AI will exert a great deal of influence on the evolution of CC.

In order to understand how the four trends outlined previously will influence the nature of future market structures driving the development of CC, the next section systematically combines these trends with the main concepts of PE, following the methodology of thought experiments. This procedure results in three scenarios for future market structures: (1) centrally orchestrated CE, (2) social bubbles CE, and (3) decentralized autonomous CE.

Future Scenarios of the Collaborative Economy

Scenario 1: Centrally Orchestrated Collaborative Economy

Given the trends outlined above, Scenario 1 – centrally orchestrated CE – is built on the PE prediction of market concentration in the direction of one or a few generalists (see Figure 1). This scenario extrapolates from what is already witnessed today, the emergence of massive networks built around certain platform providers, such as Uber, Airbnb, Amazon or WeChat. Even though in reality governments will likely regulate markets from being monopolized by a single firm, some form of extreme market consolidation might occur. Platform providers increasing demand creates positive direct and indirect network effects (Katz and Shapiro, 1985). Network effects further incentivize actors to 'herd' with others (e.g., taxi firms join the Uber network) which, in turn, can lead to one single platform (or natural monopoly) dominating a market (Amit and Zott, 2015; Fehrer *et al.*, 2018).

From a PE perspective, this would relate to firms moving from being r-Strategists to K-Strategists. In other words, as the environment in which the platform provider operates matures – the platform standard gets further spread within the further growing network – r-Strategists grow for a while and expand their offerings, what is known in PE parlance as expanding *niche width* (Noy, 2010; Carroll, 1985). While growing and connecting more and more peers, platform providers gain ownership and control over core resources, including technological infrastructure and customer data in particular. Essentially, this leads to resource concentration with the platform provider. In contrast, peer service providers and customers lose their influence. The dominant platform provider rolls out its standards not only for the technology itself but also as to how to engage on the platform. Engagement practices become aligned through the infrastructure and the governance of the dominant platform provider.

Network effects create lock-in mechanisms, that is, high switching costs that shelter the platform from the entry by standalone rivals (Eisenmann *et al.*, 2011; Farrell and Saloner, 1985; Katz and Shapiro, 1985). Thus, the platform grows as an r-Strategist until the carrying capacity of the market is exhausted – that means all peer-to-peer resources are in use. This leads to the momentum, when the market reaches its tipping point and develops from an r-strategy state to high market maturity, thus a K-Strategist state. As a K-Strategist, the platform provider will expand into the space of specialists and occupy niche after niche. At this stage, the platform provider's technology standard is universally rolled out and adopted.

Technological developments and innovations, including AI development, are driven by the platform provider. AI – similar as with all following scenarios – will have agency, but in contrast to scenario three will be controlled at all times by the major platform providers. Autonomous vehicles augmented, and virtual reality, machine learning, and intelligent robots will be developed

to the degree that they are no longer passive enablers of service and peer-to-peer interactions, but active participants in the social cyber-physical systems of the economy and society. In this first scenario, however, all technological developments will connect with the platform provider's technological standard and will be controlled by it. Thus, data produced in the interaction between technology and humans is owned by the platform provider, enabling further growth of the platform and creating new carrying capacity. In sum, this scenario predicts an economically significant increase in market concentration, centrally controlled and governed by relatively few, large platform providers.

An example supporting this scenario can be found in the transportation industry. The development and fast penetration of ride-sharing companies (e.g., Uber, Lyft) has led to customers eschewing car ownership as would be predicted by the commercialization of ownership trend discussed above. Reuters/Ipsos (2017) found that in 2017 nine percent of US adults moved to ride-sharing services as their primary mode of personal transportation with another nine percent indicating they planned to do that in 2018 (Reuters, 2017). Currently, Uber and Lyft own approximately 68% of the ride-sharing market (Fifth annual SpendSmart™ Report, 2017). However, they only provide a technology platform that brings together those with slack resources (cars) and those desiring transportation services. This opens up the possibility that in the face of declining sales, car manufacturers might ultimately decide to leverage their control of the supply of cars by creating specific lines of cars (potentially self-driving) that would be used only for ride sharing and even then within a technology platform built and maintained by the manufacturers. This would, in essence, be a service infusion strategy, something that a large number of manufacturing firms have turned to in order to remain competitive as markets evolve and mature.

However, research has shown an increase in market share of service firms often leads to a decrease in satisfaction (Wirtz and Zeithaml, 2018).

A similar development can be found in retailing, where Amazon has grown from an online book retailer to be one of the most powerful global market places (Ritala *et al.*, 2014) with a $700 billion market valuation (CNBC, 2018). For example, recently Amazon has started to collaborate with J.P. Morgan and Berkshire Hathaway to enter the insurance industry. The newly minted coalition is aiming to lower health care costs and deliver significant advancements for all patients by slashing bureaucracy, expanding telemedicine and leveraging their platform technology (Forbes, 2018). One of Amazon's significant advantages, however, is their knowledge about customers (customer data) and their behavioral patterns, resulting in more accurate risk predictions than any traditional insurance company can provide. As Amazon as a generalist already owns a marketplace that brings customers together on a global scale, it would be a logical assumption that they continue to enter industry by industry occupied by specialists and take these industries to the next level of efficiency. Their understanding and further development of the technology required to access customers and customer data would provide them with an advantage as they move towards a conglomerate of a K-generalist. In summary, it is suggested that one alternative future scenario regarding the evolution of the CE would be that a few firms would come to dominate the market.

Scenario 2: Social Bubbles Collaborative Economy

The second scenario – the social bubbles CE – is based on the prediction by PE that existing organizations in the CE will further morph to generalists covering more and more of the market (e.g., Airbnb and Uber). But in contrast to scenario one, this scenario suggests consolidation in

social bubbles. CE entrepreneurs are expected to enter this centralized market and establish as new niche players seeking rents form market innovation. Following the logic of resource partitioning, generalists leave room for specialists to innovate the market by targeting particular market segments (see Figure 1). PE predicts that organizations occupy niches in which superiority of fit with the environment supersedes a generalist's ability to adapt to a broader range of environmental conditions. This allows for the emergences of 'pockets' within this market. Thus, niche (bubble) specialists will occupy the market space not covered by the large platform providers and thereby avoid direct competition (Noy, 2010).

To be more effective in these niches, it is proposed that specialists will make use of AI-enabled personalization which is effective and efficient since it automatically observes customer behavior (Chung *et al.*, 2016). This will allow better adaptation to customer preferences in a particular niche as opposed to appealing to the entire market like generalists. With this should also come enhanced user experience and increased relevance of the presented content (Keyzer *et al.*, 2015; Rader, 2017). Since information on platforms such as Facebook can create information overload (Koroleva and Kane, 2017), personalization algorithms aim at reducing this overload by connecting users with more relevant content (Rader, 2017). For example, personalized search engines have become a common source of knowledge and people seem to accept the information authority of the large platform providers, such as Google, despite the fact that filtering leads to people seeing increasingly narrow sets of search results when compared to the actual variety available (Tran and Yerbury, 2015).

In media consumption, more effective matching of information preferences has led to what is known as "echo-chamber" or "filter bubble" (Flaxman *et al.*, 2016). This is likely to continue since "things [with regards to personalization] that feel uncomfortable now won't feel like this in

5 years (Seymour, 2014). The “echo” within a small “chamber” is based on the fact that most people are more likely to consume and share information within their social circle (Bozdag *et al.*, 2014) and interact with likeminded people while at the same time interactions outside these social bubbles become increasingly rare (Williams *et al.*, 2015). This echo-chamber reinforces itself by the fact that interacting via platforms increases perceived relationship closeness (Rader, 2017), which in turn is likely to lead to even more interaction and information sharing. However, in particular, in media consumption, echo-chambers have vast negative consequences such as intolerance and ideological segregation and antagonism (Bozdag *et al.*, 2014). Outside the media, field personalization does not seem to have similar negative effects since recommendation systems, for example, have shown to lead to more diversity of purchases (Hosanagar *et al.*, 2014).

Similar to the filter bubble, shared interests will increase the relevance of the service (or good) to be exchanged and will have positive outcomes, such as increased matching of preferences. This, in turn, leads to further perceived closeness which will reinforce the interaction and CC within the bubble. PE predicts that organizations aim to grow and move from specialists to generalists, thus adapted to CC, it is likely that these bubble platform providers may aim to grow by extending their portfolio of services. Although it can be argued that a similar development towards social bubbles can happen in the CE, niche providers target a specific customer segment, with shared interests (e.g., Mamikreisel a peer to peer platform for German-speaking moms (https://mamikreisel.de) or Accomable, the first independent peer to peer accommodation platform for disabled people (https://accomable.com)). Despite this prediction, that different service providers will serve social bubbles, evidence of service bubbles can also be found within a platform: Uber has launched UberBlack – an elevated driving experience with professional drivers and high-end cars – and UberPool – a service offering shared rides with other Uber.

Scenario 3: Decentralized Autonomous Collaborative Economy

The third scenario – decentralized autonomous CE – is built on, but goes beyond, the predictions of PE. In line with the chosen methodology of thought experiments it takes the potential for peer-to-peer connectivity to its extreme, leading to not only 'blurring of boundaries' between customers and micro-entrepreneurs, but a complete openness and transparency among all participants in the market. The scenario entails that technology will take over agency and the ability to connect customers and service providers in open, deregulated markets. Customers and service providers agree on smart contracts embedded in the algorithm of the blockchain, which sets the rules for service exchange.

The blockchain will set the stage for self-organized (autonomous) coordination on a large scale and global peer-to-peer interaction by providing a reliable, open programmable infrastructure. The technology can be compared with a centreless 'living organism' operated by a wide crowd of engaged participants (Field, 2017). Since (AI) can connect individuals on a large scale, with (almost) no intermediary being involved (Andreassen *et al.*, 2018), no single point of power (e.g., platforms, such as Facebook Inc.) entirely governs and controls the network (Iansiti and Lakhani, 2017). The blockchain executes collective agency and allows individuals to interact with one another. Individuals – whomay be humans and non-humans (i.e., AI) – would be connected through the social cyber-physical system and own shares of this system. These shares could be distributed according to the participant's engagement perceived by other peers (Field, 2017).

Described from a PE perspective, technological advances (or discontinuities) in the area of AI, machine learning, in particular, could lead to radical creative destruction (Baum, 1996). This,

in turn, might result in firms becoming obsolete since they no longer generate higher efficiency for customers or service providers than the open market (Coase, 1937; Williamson, 1983). Thus, agency of technology, in this scenario, not only weakens the competitive position of focal firms, it somehow questions the existence of firms. Although coordination mechanisms are still important in such complex systems, coordination can be provided by organizational communities based on shared goals and shared values supported through incentives and the self-executing blockchain (Field, 2017).

In the decentralized autonomous CE, economic and social value for all participants is leveraged by network effects (Katz and Shapiro, 1985) and complementarities (Milgrom and Roberts, 1995) due to indefinite access to resources, such as knowledge and the capabilities to apply this knowledge. Economic incentives drive service exchange and encourage the supply of open, shareable resources (such as open-source codes or sharing music files). Because individuals' incentives increase, when the network as a whole grows, engagement in maintaining the network is reinforced. The supply of open resources means the carrying capacity in this scenario is underutilized (Todd *et al.*, 2014). Consequently, with the creation of more open resources, the organizational community can scale indefinitely while keeping their agility and coherence due to the blockchain technology (Field, 2017).

Governance in the decentralized autonomous CE is distributed among all participants. Participants are evaluated by other participants based on their engagement and contribution in the past. These reciprocal evaluations result in 'reputation scores' for each participant. The higher the reputation in certain competence fields, the more influence has a focal participant in these competence fields regarding the approval, decline, and evaluation of transactions of other actors. The learning algorithm distributes decision power accordingly to the reputation score in a

competence field because not every participant can be asked for approval of every single decision. (Iansiti and Lakhani, 2017; Field, 2017). This mechanism ensures highly efficient and effective decision-making processes. In summary, it has been argued that the third alternative regarding the evolution of CC would be an organizational community similar to a living organism with its value system and opinions and a collective brain with collective agency.

An example of an open self-organizing system is ShareRing (https://sharering.network/en), a decentralized marktplace supported by the blockchain designed for sharing absolutely everything – from storage space to tools, clothes, jewelry, food or even your cooking skills. Small local service providers, as well as superstores, can enter the network with low entry barriers, such as service fees. Through creating their own crypto currency (SharePay), ShareRing significantly reduces the costs and effort of international trades including bank transfers and currency risk. ShareRing provides a secure way to pay for sharing services anywhere in the world, thus opens the global market place for very rare and fragmented services. Similar to other blockchain-based decentralized organizations, exchange at ShareRing is based on smart contracts, applications that run without any possibility of downtime, censorship, fraud or third-party interference. These smart contracts self-execute without an intermediaryinvolved and based on instructions given in the past (Iansiti and Lakhani, 2017).

Table 1 summarizes and contrasts the three future scenarios for CC based on different development pathways of connectivity, engagement, commercialization of ownership and agency of technology.

	Centrally Orchestrated CE	Social Bubbles CE	Decentralized Autonomous CE
Trends impacting future CC			
Connectivity	Enhanced connectivity; mediated through major platform providers	Enhanced connectivity within social bubble; mediated through bubble managing platform providers	Ultimate connectivity; mediated through the self-adjusting decentralized blockchains
Engagement	Engagement practices aligned and standardized, centrally governed by major platform providers	Engagement practices differ from social bubble to social bubble, aligned and governed predominantly by the bubble platform provider with some distributed governance among members in the social bubble	Engagement practices diverse but standardized regarding the algorithm used to operate with the blockchain, governance is distributed among all actors in the market
Commercialization of ownership	Ownership and access to service (and goods) fully commercialized and centralized with platform provider	Ownership and access to service (and goods) are shared within the social bubble	Ownership and access to service (and goods) are on an individual level fully decentralized within the blockchain
Agency of technology	Technology has agency but is controlled by major platform providers, data produced in the interaction between technology and humans is owned by platform providers, enabling their growth	Technology has agency but is controlled by the bubble platform providers, data produced in the interaction between technology and humans is shared in the bubble, enabling growth of the bubble	Technology has agency and is controlled by the crowd, data produced in the interaction between technology and humans is available in the cloud, enabling growth of the self-organized system
Future market structures			
Population ecology prediction	Market concentration in the direction of one or a few generalists	Entrepreneurs enter concentrated market and establish as niche players	Openness and transparency among all participants in the market

Resource partitioning & generalization versus specialization	Low resource partitioning, platform providers morphe into generalists and push specialists out of the market	Medium to high resource partitioning, social bubbles emerge; market shared by a medium number of generalists and specialists	High resource partitioning, all individuals are micro-entrepreneurs and offer their service through free, open access technology, micro-entrepreneurs have collective market power, generalists no longer exist
Market maturity (r-strategist or K-strategist market)	High maturity, K-Strategist environment, low uncertainty, low mortality of organizations	Medium maturity, entrepreneurial environment including K-strategist and r-strategists, high uncertainty, high mortality of r-strategists	Low maturity, r-strategist environment, high uncertainty, low mortality r-strategist
Carrying capacity	Carrying capacity of market is exhausted, major platform providers have resources completely in use, they might expand carrying capacity by technological innovations	Some free carrying capacity due to growing numbers of entrepreneurs forming social bubbles	Free carrying capacity due to open available free resources, including customer data and technological infrastructure

Table 1: Future Scenarios of the Collaborative Economy

Deriving a research agenda

In this research, thought experiments (Cooper, 2005) were applied in combination with population ecology (Hannan and Freenan John, 1977), to develop future scenarios as *'ideal types'* in a Weberian sense (Weber, 1978). The objective of this study is to suggest developmental pathways leading to three scenarios the CE might develop toward 2050. This approach allows for identifying implications for theory and challenges for managers inside and outside the CE. Both, the theoretical implications and the managerial challenges allow deducing emerging research questions and hint at a research agenda of future topics around the CE.

Implications for Theory

Population ecology was chosen to help frame extreme future scenarios. Yet, in outlining these scenarios, this research helps to advance PE theory. Scenarios 1 and 3 represent market conditions of complete centralisation and complete decentralization which might have implications for how PE "works" at its limits. A traditional advantage of PE has been its ability to explain organizational evolution and diversity. Perhaps because historically there have been few, if any, examples of these extreme scenarios, there has been little theorizing about how PE predictions perform at these limits. For example, how close is reality going to resemble the complete decentralization scenario in which firms do not continue to be formed at all? Is it likely – as predicted in the third scenario – that firms face near-certain failure as they attempt to appropriate rents in a context of complete decentralization which works to undermine these very efforts? Even the slightest chance of success could have payoffs so significant that entrepreneurs may still try. Exploring these possibilities at the extremes of a theory can help explore and extend some of the assumptions underpinning the theory.

Another traditional view in PE is that populations grow and organizations form under the assumption of finite resources. When extrapolating the four trends presented in this paper – AI and connectivity in particular – this research shows that focal resources such as knowledge and (customer) data might have to be defined as infinite. This has interesting consequences for the conceptualization of the carrying capacity, one of the central concepts of the PE. Future research may want to refine the conceptualization of carrying capacity and the role of competition from a PE perspective.

When predicting the future scenarios, the environment itself is not taken for granted but as emergent. While it was not the intention to resolve tensions between the institutional and PE paradigms, the present study creates insights about how organizational survival and population-level outcomes are related. Future research might explore the interaction between the different levels of analysis, thus responding to more recent calls to explore the complementarities between ecological and institutional theories of organizations (Lander and Heugens, 2017). Another area for future research is to broaden the theoretical framing provided by PE by drawing on research in evolutionary psychology and anthropology. This would allow for the exploration of the role of human norms such as ethics and morality as an evolutionary factor that leads to cooperation (Tomasello, 2014).

Challenges for Management and Public Policy: Deriving a Research Agenda

While some might consider it a step too far to propose managerial challenges linked to the trends and for the predicted CE scenarios in 2050, there is value in stretching one's consideration of what the future might bring. At the very least, it helps to test the robustness of assumptions used today to significant, plausible market changes in the future. There is considerable value in

exploring some managerial and public policy challenges given the broad societal, economic, and political implications of the market predictions.

Four *trends* expected to impact the future development of the CE were identified that pose managerial challenges: (1) increased connectivity and (2) engagement, (3) commercialization of ownership, and (4) agency of technology. First, a world can be experienced today where everything is becoming *connected*, so the lines that traditionally separated customers, employees, citizens, companies, and even governments, into silos are blurring. All of this will require businesses to be aware of their constantly evolving business context, and maintain the speed, focus, and agility to meet customer needs and seize business opportunities. On the research side, it will necessitate scholars continue to explore what it takes to create increasingly relevant and valuable customer or more general user experiences over time.

Second, the evolution of human-machine interaction and engagement will shape how the workforce supporting industries in the CE will fare (Subramony *et al.*, 2018). Although much of the discussion around this topic has centred on how technology may eliminate jobs, the focus more recently has been on how machines are likely to augment humans and how humans can help enable machines in their work (Wirtz *et al.*, 2018). This would mean that depending on the industry and context of the CE; machines could have the ability to enhance workers' performance, empower them and improve value co-creation.

Third, if customers *commercialize their ownership* and owning becomes less important, will customers in the future express themselves in a different, potentially more extreme and variable way and switch roles more often? If products are made to be used by multiple sequential users will this change product design and make it more mainstream either for all customers or within the bubble? When customers only ever access goods, and there are seldom individuals who

take on ownership of a good, will this lead to an increase or decrease of the throwaway society? Will we be able to more efficiently use the world's resources or will a system with enormous slack resources evolve, because companies will orient themselves to peak demand?

Fourth, the development of technology, how firms adopt it across industries, and how customers are willing to integrate what is offered into their daily lives, will ultimately determine the trajectory of how the CE will develop. As technologies such as AI grow in their capabilities, issues such as how businesses in the CE can utilize AI to be responsible and productive contributors and how managers can gain customers' trust and confidence when implementing AI based decisions and actions emerge. AI will be developed to the degree that it no longer will be a passive enabler of service and peer-to-peer interactions, but active participants in the social cyber-physical systems defining the economy and society. Thus, we encourage scholars to explore the role of technology as an actor rather than an enabler for service exchange. If technology takes agency data is more or less automatically collected.

Furthermore, as noted in the paper maintaining data veracity will be critical for the future of the CE. Research questions about how businesses can transform themselves, how they can use customer data to reduce vulnerability and bias and increase accuracy and trust in the data will be key. Especially if data collection and sharing among people, products, systems, and devices happens in real time. Technologies such as blockchain and the ability to create smart contracts will be critical in enabling frictionless business and building scale.

Managerial challenges that inform a research agenda can not only be derived from the trends, but also from the scenarios. A *highly centralized CE* implies few firms mediating service delivery enabling CC. One central challenge of these large, dominant firms will be to sustain positive customer and stakeholder engagement. There is some evidence that customers do not have

highly positive impressions of large corporations. A study conducted by CNBC/Burson-Marsteller Corporate Perception Indicator (2014) found that 48% of customers in the US and Western Europe fear corporations rather than seeing them as a "source of hope." If CC evolves into something dominated by a few very large firms and these perceptions do not change, it is possible that customers will be less willing to engage, particularly with heightened concerns about data privacy. The current controversy surrounding Facebook and their misuse of customer data is something of a litmus test for how dominant firms in a centralized CE might face. Managers must, in the first instance, focus on the issues of privacy, security, and data ownership. But they must also maintain a balance with the need to generate a positive, bespoke customer experience. Further research should explore how to most effectively find that balance. Further, research should investigate whether growing CE providers should consider implementing a multi-brand strategy similar to some of the big FMCG conglomerates like Procter & Gamble, Unilever or Nestle and similar to the strategy pursued by Airbnb (e.g., Airbnb and Accomable).

The legal system is only starting to grapple with the enormity of the regulation challenges presented by increasingly large incumbents in the new economy. This is made more complicated by the fact that, for many of these firms, success is achieved by finding loopholes in the laws designed to regulate the market they seek to disrupt (e.g., Uber). Public policymakers need to consider how regulations – often designed for a time when existing technologies and challenges were inconceivable – can remain relevant for the new economy. At the very least coordination across states and national borders should be a priority such that the policy response matches the global reach of the highly centralized CE. This sort of coordination is apparent in the EU where prompted by the requirements of the EU-wide General Data Protection Regulation (GDPR), Facebook instituted a new 'privacy center' in their application which they plan to roll out globally

(Hern, 2018). From a consumer behavior standpoint, it would be interesting to investigate what position of various non-profit organizations, consumer groups as opposed to the legal authorities have in influencing policies.

The *social bubbles CE* presents some challenges for service management and public policy. The idea of "social bubbles" or "echo chambers" was taken from media consumption (Flaxman *et al.*, 2016) and a key assumption was that each bubble settles on its engagement practices and governance mechanisms. However, whereas ideological positions in media consumption are relatively stable over time (Althaus and Tewksbury, 2000) consumption practices are likely to be more variable. Thus, it is unclear whether customers over their lifespan move from one social bubble to another or whether service providers would age with their customers and maintain one stable social bubble around their customer segment. Further, it is unclear how platform businesses such as Airbnb or Uber – now considered mainstream – will position themselves in the social bubble CE. Will they choose the most central bubble or will they aim to create multiple social bubbles under their umbrella brand (such as Uber as explained before)?

From a public policy perspective, regulators need to be concerned with the added insularity to which the social bubble CE leads, which is likely to increase isolation and reduce social capital within communities. At worst, it may also fan the flames of intolerance towards members of other bubbles. Regulators may need to explore ways in which they can hold organizations in the collaborative bubbles economy to account for feeding members inaccurate or untrue messaging; the latter, of course, is the subject of inquiries into outside influence over the 2016 US federal election. Consumer behavior research could investigate questions around the stability of social bubbles, their potential for discrimination and isolation, how companies could best position themselves in a social bubble world.

The *fully decentralized CE* has vastly different challenges for public policy formation as, unlike the first two scenarios, there are no corporations to regulate. Further, the infrastructure facilitating this market will be decentralized and not owned or controlled by any one entity. Public blockchains such as Ethereum, for example, defy intervention and control by governments. More importantly, perhaps, they remove the need for government oversight and involvement altogether. Other challenges, however, will emerge. Since this scenario will require access to blockchains and as such the internet we need to remind ourselves that despite a 95% internet penetration in the US the internet penetration in continents like Africa or Asia is still below 50% (Internet World Stats, 2018). Thus, whereas today the criteria to differentiate the developed and emerging world is per capita income, will it in future be the ability to take part the decentralized economy? Will customers or regions without access to the internet be isolated from the world economy? Will the mobility between countries decrease because of this potential isolation? Further, one issue relates to the social coverage for those, who are less 'resourceful' (Fisk *et al.*, 2018). What will social compensation mechanisms in an autonomous deregulated market look like?

Another of the unsolved issues of a decentralized autonomous system relates to governance. While distributed or decentralized governance may have intuitive appeal, its execution seems highly problematic. What are the rules for distributing governance? If reputation scores are the ultimate measure of influence in the system and reputation scores are created based on every single interaction, what happens, if we [humans] have a 'bad day' or "bad teenage years"? Can a few bad reviews destroy an individual's reputation? And what happens with those individuals with relatively bad reputation scores, will these be condemned to a life at the margins of the society? This is one issue, which can be currently observed with Uber drivers, a few bad reviews exclude them from Uber's ecosystem and thus may cut off their only source of income.

One consequence of distributed governance for humans may be ultimate stress and existential fear. Future research could contribute by addressing some of these challenges of a fully decentralized CE.

Conclusion

To survive in a very competitive and disruptive market environment, it is extremely important for companies within but also outside the collaborative economy to prepare for future market conditions. PE, a theory that is focused on the survival of organizations and thought experiments, a methodology focused on developing hypothetical scenarios by taking "what if" questions to the extreme have built the foundation for this research. The objective of this paper is to identify and explore trends that are currently at play or those likely to disrupt businesses in the far future and make educated projections about what are likely to be issues that scholars, businesses, and governments need to address. In the paper, increased connectivity and engagement, commercialization of ownership and agency of technology are identified as main trends, and the challenges for management were elaborated to derive potential areas of research from these trends. Depending on how these trends unfold three future scenarios for the CE were created: centrally orchestrated, social bubble and fully decentralized CE. Different markets may be directed towards different future scenarios. This means the three presented scenarios are not mutually exclusive but can coexist in different pockets of the economy depending on the development phase of the market.

Each of them pose their challenges for managers in the CE. In a centrally orchestrated CE, the dominance of the big platform providers, their data collection and handling and their governance and regulation through government authorities are important challenges. In a social

bubble CE, the key challenges are isolation, discrimination, and mobility across bubbles. In contrast, the openness of the decentralized system poses the challenge of coordination, governance, and participation of parts of the population in the system.

References

Althaus, S.L. and Tewksbury, D. (2000), "Patterns of Internet and traditional news media use in a networked community", *Political Communication*, Vol. 17 No. 1, pp. 21–45.

Amit, R. and Zott, C. (2015), "Crafting Business Architecture. The Antecedents of Business Model Design", *Strategic Entrepreneurship Journal*, Vol. 9 No. 4, pp. 331–350.

Andreassen, T.W., Lervik-Olsen, L., Snyder, H., van Riel, A.C., Sweeney, J.C. and van Vaerenbergh, Y. (2018), "Business Model Innovation and Value-creation: The Triadic Way", *Journal of Service Management*, Vol. 29 No. 5.

Baum, J.A. (1996), *Organizational Ecology. Clegg, SR & Hardy, C. & Nord, WR (toim.) Handbook of Organization Studies. pp 77-114*, Sage. London.

Belk, R. (2014), "You are what you can access. Sharing and collaborative consumption online", *Journal of Business Research*, Vol. 67 No. 8, pp. 1595–1600.

Belk, R.W. (1988), "Possessions and the extended self", *Journal of Consumer Research*, Vol. 15 No. 2, pp. 139–168.

Belk, R.W. (2013), "Extended Self in a Digital World", *Journal of Consumer Research*, Vol. 40 No. 3, pp. 477–500.

Bendapudi, N. and Leone, R.P. (2003), "Psychological implications of customer participation in co-production", *Journal of Marketing*, Vol. 67 No. 1, pp. 14–28.

Benoit, S., Baker, T.L., Bolton, R.N., Gruber, T. and Kandampully, J. (2017a), "A triadic framework for collaborative consumption (CC). Motives, activities and resources & capabilities of actors", *Journal of Business Research*, Vol. 79, pp. 219–227.

Benoit, S., Baker, T.L., Bolton, R.N., Gruber, T. and Kandampully, J. (2017b), "A triadic framework for collaborative consumption (CC). Motives, activities and resources & capabilities of actors", *Journal of Business Research*, Vol. 79, pp. 219–227.

Bolton, R.N., McColl-Kennedy, J.R., Lilliemay, Gallan, A.S., Orsingher, C., Witell, L. and Zaki, M. (2018), "Customer Experience Challenges: Bringing Together Digital, Physical and Social Realms", *Journal of Service Management*, Vol. 29 No. 5.

Bonaccorsi, A., Giannangeli, S. and Rossi, C. (2006), "Entry Strategies under Competing Standards: Hybrid Business Models in the Open Source Software Industry", *Management Science*, Vol. 52 No. 7, pp. 1085–1098.

Botsman, R. and Rogers, R. (2010a), "Beyond zipcar: Collaborative consumption", *Harvard Business Review*, Vol. 88 No. 10, p. 30.

Botsman, R. and Rogers, R. (2010b), *What's mine is yours: how collaborative consumption is changing the way we live*, Harper Collins, New York.

Bowden, J.L.-H. (2009), "The Process of Customer Engagement. A Conceptual Framework", *The Journal of Marketing Theory and Practice*, Vol. 17 No. 1, pp. 63–74.

Bowen, D.E. (1986), "Managing customers as human resources in service organizations", *Human resource management*, Vol. 25 No. 3, pp. 371–383.

Bozdag, E., Gao, Q., Houben, G.-J. and Warnier, M. (2014), "Does offline political segregation affect the filter bubble? An empirical analysis of information diversity for Dutch and Turkish Twitter users", *Computers in human behavior*, Vol. 41, pp. 405–415.

Breidbach, C.F. and Brodie, R.J. (2017), "Engagement platforms in the sharing economy", *Journal of Service Theory and Practice*, Vol. 27 No. 4, pp. 761–777.

Brodie, R.J., Fehrer, J.A., Jaakkola, E. and Conduit, J. (2018), "Actor Engagement in Networks: Defining the Conceptual Domain", *forthcoming*.

Brodie, R.J., Hollebeek, L.D., Juric, B. and Ilic, A. (2011), "Customer Engagement. Conceptual Domain, Fundamental Propositions, and Implications for Research", *Journal of Service Research*, Vol. 14 No. 3, pp. 252–271.

Čaić, M., Odekerken-Schröder, G. and Mahr, D. (2018), "Service robots. Value co-creation and co-destruction in elderly care networks", *Journal of Service Management*, Vol. 29 No. 2, pp. 178–205.

Carroll, G.R. (1985), "Concentration and Specialization: Dynamics of Niche Width in Populations of Organizations", *American Journal of Sociology*, Vol. 90 No. 6, pp. 1262–1286.

Chandler, J.D. and Lusch, R.F. (2015), "Service Systems. A Broadened Framework and Research Agenda on Value Propositions, Engagement, and Service Experience", *Journal of Service Research*, Vol. 18 No. 1, pp. 6–22.

Chung, T.S., Wedel, M. and Rust, R.T. (2016), "Adaptive personalization using social networks", *Journal of the Academy of Marketing Science*, Vol. 44 No. 1, pp. 66–87.

CNBC (2018), "Amazon surpasses Microsoft in market value for the first time", available at: https://www.cnbc.com/2018/02/14/amazon-surpasses-microsoft-in-market-value-for-the-first-time.html (accessed 6 April 2018).

CNBC/Burson-Marsteller Corporate Perception Indicator (2014), "CNBC and Burson-Marsteller Reveal Results of First-Ever CNBC/Burson-Marsteller Corporate Perception Indicator", available at: https://www.prnewswire.com/news-releases/cnbc-and-burson-marsteller-reveal-results-of-first-ever-cnbcburson-marsteller-corporate-perception-indicator-275961471.html (accessed 24 April 2018).

Coase, R.H. (1937), "The nature of the firm", *economica*, Vol. 4 No. 16, pp. 386–405.

Cooper, R. (2005), "Thought experiments", *Metaphilosophy*, Vol. 36 No. 3, pp. 328–347.

Delacroix, J. and Carroll, G.R. (1983), "Organizational Foundings: An Ecological Study of the Newspaper Industries of Argentina and Ireland", *Administrative Science Quarterly*, Vol. 28 No. 2, pp. 274–291.

Earnest blog (2018), "How Much Are People Making From the Sharing Economy?", available at: https://www.earnest.com/blog/sharing-economy-income-data (accessed 6 April 2018).

Eisenmann, T., Parker, G. and van Alstyne Marshall (2011), "Platform Envelopment", *Strategie Management Journal*, Vol. 32, pp. 1270–1285.

Farrell, J. and Saloner, G. (1985), "Standardization, compatibility, and innovation", *The RAND Journal of Economics*, pp. 70–83.

Fehrer, J.A., Woratschek, H. and Brodie, R.J. (2018), "A Systemic Logic for Platform Business Models", *Journal of Service Management*, https://doi.org/10.1108/JOSM-02-2017-0036.

Field, M. (2017), "The Operating System for DAOs", *White Paper*.

Fifth annual SpendSmart™ Report (2017), "Press Release: Certify Adds Up the Year in Business Travel and Entertainment Expense Spending", available at: https://www.certify.com/PR-2018-01-30-Certify-Adds-Up-the-Year-in-Business-Travel-and-Entertainment-Expense-Spending-.

Fisk, R.P., Dean, A.M., Alkire (née Nasr), L., Joubert, A., Previte, J., Robertson, N. and Rosenbaum, M. (2018), "Design for Service Inclusion: Creating Inclusive Service Systems by 2050", *Journal of Service Management*, Vol. 29 No. 5.

Flaxman, S., Goel, S. and Rao, J.M. (2016), "Filter bubbles, echo chambers, and online news consumption", *Public Opinion Quarterly*, Vol. 80 No. 1, pp. 298–320.

Forbes (2018), "Amazon, Berkshire & JPMorgan Can Fix Healthcare With Technology - And By Studying Winners", available at: https://www.forbes.com/sites/steveandriole/2018/02/19/amazon-berkshire-jpmorgan-can-fix-healthcare-with-technology-and-by-studying-winners/#762a020c3a02 (accessed 6 April 2018).

Hannan, M.T. and Freenan John (1977), "The Population Ecology of Organizations", *Americal Journal of Sociology*, Vol. 82 No. 5, pp. 929–964.

Hartl, B., Hofmann, E. and Kirchler, E. (2016), "Do we need rules for "what's mine is yours"? Governance in collaborative consumption communities", *Journal of Business Research*, Vol. 69 No. 8, pp. 2756–2763.

Hern, A. (2018), "Facebook to roll out new tools in response to EU privacy laws", available at: https://www.theguardian.com/technology/2018/jan/23/facebook-new-privacy-tools-response-to-eu-privacy-laws-sheryl-sandberg (accessed 24 April 2018).

Horváth, I. (2014), "What the Design Theory of Social-Cyber-Physical Systems Must Describe, Explain and Predict?", in *An Anthology of Theories and Models of Design*, Springer, pp. 99–120.

Hosanagar, K., Fleder, D., Lee, D. and Buja, A. (2014), "Will the Global Village Fracture Into Tribes? Recommender Systems and Their Effects on Consumer Fragmentation", *Management Science*, Vol. 60 No. 4, pp. 805–823.

Huang, M.-H. and Rust, R.T. (2018), "Artificial Intelligence in Service", *Journal of Service Research*, Vol. 53 No. 1, 109467051775245.

Iansiti, M. and Lakhani, K.R. (2017), "The Truth About Blockchain", *Harvard Business Review*, pp. 118–130.

Internet World Stats (2018), "Internet Usage Statistics:The Internet Big Picture", available at: https://www.internetworldstats.com/stats.htm (accessed 28 April 2018).

Javalgi, R.G. and Scherer, R.F. (2005), "The Dynamics of Global E-Commerce: an Organizational Ecology Perspective", *International Marketing Review*, Vol. 22 No. 4, pp. 420–435.

Katz, M.L. and Shapiro, C. (1985), "Network externalities, competition, and compatibility", *The American economic review*, Vol. 75 No. 3, pp. 424–440.

Key, T.M. (2017), "Domains of Digital Marketing Channels in the Sharing Economy", *Journal of Marketing Channels*, Vol. 24 1-2, pp. 27–38.

Keyzer, F. de, Dens, N. and Pelsmacker, P. de (2015), "Is this for me? How consumers respond to personalized advertising on social network sites", *Journal of Interactive Advertising*, Vol. 15 No. 2, pp. 124–134.

Koroleva, K. and Kane, G.C. (2017), "Relational affordances of information processing on Facebook", *Information & Management*, Vol. 54 No. 5, pp. 560–572.

Kumar, K. and van Dissel, H.G. (1996), “Sustainable collaboration: managing conflict and cooperation in interorganizational systems”, *Mis Quarterly*, pp. 279–300.
Kumar, V., Lahiri, A. and Dogan, O.B. (2017), “A strategic framework for a profitable business model in the sharing economy”, *Industrial Marketing Management*.
Kumar, V. and Pansari, A. (2016), “Competitive Advantage through Engagement”, *Journal of Marketing Research*, Vol. 53 No. 4, pp. 497–514.
Lander, M.W. and Heugens, P.P. (2017), “Better Together: Using Meta-Analysis to Explore Complementarities between Ecological and Institutional Theories of Organization”, *Organization Studies*, Vol. 38 No. 11, pp. 1573–1601.
Lawson, S.J., Gleim, M.R., Perren, R. and Hwang, J. (2016), “Freedom from ownership. An exploration of access-based consumption”, *Journal of Business Research*, Vol. 69 No. 8, pp. 2615–2623.
Mair, J. and Reischauer, G. (2017), “Capturing the dynamics of the sharing economy. Institutional research on the plural forms and practices of sharing economy organizations”, *Technological Forecasting and Social Change*, Vol. 125, pp. 11–20.
Matzler, K., Veider, V. and Kathan, W. (2015), “Adapting to the sharing economy”, *MITSloan*, Vol. 56 No. 2, pp. 70–79.
Milgrom, P. and Roberts, J. (1995), “Complementarities and fit strategy, structure, and organizational change in manufacturing”, *Journal of accounting and economics*, Vol. 19 No. 2, pp. 179–208.
Moeller, S., Ciuchita, R., Mahr, D., Odekerken-Schröder, G. and Fassnacht, M. (2013), “Uncovering collaborative value creation patterns and establishing corresponding customer roles”, *Journal of Service Research*, Vol. 16 No. 4, pp. 471–487.
Moeller, S. and Wittkowski, K. (2010), “The burdens of ownership. Reasons for preferring renting”, *Managing Service Quality: An International Journal*, Vol. 20 No. 2, pp. 176–191.
Ng, I.C.L. and Wakenshaw, S.Y.L. (2017), “The Internet-of-Things: Review and research directions”, *International Journal of Research in Marketing*, Vol. 34 No. 1, pp. 3–21.
Nordmann, A. (2005), *Wittgenstein's Tractatus: an introduction*, Cambridge University Press.
Noy, E. (2010), “Niche strategy: merging economic and marketing theories with population ecology arguments”, *Journal of Strategic Marketing*, Vol. 18 No. 1, pp. 77–86.
PennState University (2016), “From Air Mattresses to Unregulated Business: An Analysis of the Other Side of Airbnb”, available at: http://3rxg9qea18zhtl6s2u8jammft-wpengine.netdna-ssl.com/wp-content/uploads/2016/01/0000-0000_PennState_AirBnbReport_011916ee_Embargo.pdf (accessed 6 April 2018).
Poole, D., Mackworth, A. and Goebel, R. (1998), “Computational intelligence: a logical approach”.
PWC (2014), “The Sharing Economy”, available at: https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc_etude_sharing_economy.pdf (accessed 28 April 2018).
Rader, E. (2017), “Examining user surprise as a symptom of algorithmic filtering”, *International Journal of Human-Computer Studies*, Vol. 98, pp. 72–88.
Reuters (2017), “Some Uber and Lyft riders are giving up their own cars: Reuters/Ipsos poll”, available at: read:https://www.reuters.com/article/us-autos-rideservices-poll/some-uber-and-

lyft-riders-are-giving-up-their-own-cars-reuters-ipsos-poll-idUSKBN18L1DA (accessed 4 April 2018).
Richins, M.L. (1994), "Special possessions and the expression of material values", *Journal of Consumer Research*, Vol. 21 No. 3, pp. 522–533.
Ritala, P., Golnam, A. and Wegmann, A. (2014), "Coopetition-based business models: The case of Amazon.com", *Industrial Marketing Management*, Vol. 43, pp. 236–249.
Saritas, O. and Nugroho, Y. (2012), "Mapping issues and envisaging futures: An evolutionary scenario approach", *Technological Forecasting and Social Change*, Vol. 79 No. 3, pp. 509–529.
Seymour, C. (2014), "All Content Is Personal: The Importance of Knowing Your Audience", available at: http://www.econtentmag.com/Articles/Editorial/Feature/All-Content-Is-Personal-The-Importance-of-Knowing-Your-Audience-97904.htm (accessed 29 March 2018).
Storbacka, K., Brodie, R.J., Böhmann, T., Maglio, P.P. and Nenonen, S. (2016), "Actor engagement as a microfoundation for value co-creation", *Journal of Business Research*, Vol. 69 No. 8, pp. 3008–3017.
Subramony, M., Solnet, D., Groth, M., Hartley, N., Kim, P., Yagil, D. and Golubovskaya (2018), "Service Work in 2050: A Work Ecosystems Perspective", *Journal of Service Management*, Vol. 29 No. 5.
Sundararajan, A. (2016), *The sharing economy: The end of employment and the rise of crowd-based capitalism*, Mit Press.
Todd, P.R., Javalgi, R.G. and Grossman David (2014), "Understanding the characteristics of the growth of SMEs in B-to-B markets in emerging economies: an organizational ecology approach", *Journal of Business and Industrial Marketing*, Vol. 29 No. 4, pp. 295–303.
Tomasello, M. (2014), "The ultra-social animal", *European journal of social psychology*, Vol. 44 No. 3, pp. 187–194.
Tran, T. and Yerbury, H. (2015), "New Perspectives on Personalised Search Results: Expertise and Institutionalisation", *Australian Academic & Research Libraries*, Vol. 46 No. 4, pp. 277–290.
Tushman, M.L. and Anderson, P. (1986), "Technological discontinuities and organizational environments", *Administrative Science Quarterly*, pp. 439–465.
van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Pick, D., Pirner, P. and Verhoef, P.C. (2010), "Customer Engagement Behavior. Theoretical Foundations and Research Directions", *Journal of Service Research*, Vol. 13 No. 3, pp. 253–266.
Weber, M. (1978), *Economy and society: An outline of interpretive sociology*, Vol. 1, Univ of California Press.
Williams, H.T.P., McMurray, J.R., Kurz, T. and Lambert, F.H. (2015), "Network analysis reveals open forums and echo chambers in social media discussions of climate change", *Global Environmental Change*, Vol. 32, pp. 126–138.
Williamson, O.E. (1983), "Organizational innovation: the transaction cost approach", in Ronen, J. (Ed.), *Entrepreneurship*, Lexington Books, Lexington Books, MA, pp. 101–133.

Wirtz, J., Patterson, P., Kunz, W., Gruber, T., Lu, V.N., Paluch, S. and Martins, A. (2018), "Service Robots in the Front Line: Will it be a Brave New World?", *Journal of Service Management*, Vol. 29 No. 5.

Wirtz, J. and Zeithaml, V. (2018), "Cost-effective service excellence", *Journal of the Academy of Marketing Science*, Vol. 46 No. 1, pp. 59–80.

World Economic Forum (2016), "The Future of Jobs Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution", available at: http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf (accessed 14 November 2017).

Yao, X. and Lin, Y. (2016), "Emerging manufacturing paradigm shifts for the incoming industrial revolution", *International Journal of Advanced Manufacturing Technology*, Vol. 85, pp. 1665–1676.