A FRAMEWORK OF PLATFORM DESIGN MECHANISMS, PLATFORM CONGRUENCE AND VALUE CREATION ON C2C PLATFORMS

Research Paper

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Abstract

Platforms such as Airbnb, Uber, and Kickstarter are driving digital disruption in a range of industries and are gaining attention in recent research. These platforms implement design mechanisms to mediate different types of exchange between individual consumers. The growing volume and heterogeneity of extant research make it challenging to dissociate research on C2C (consumer-to-consumer) platforms and to explain how platform mechanisms lead to value creation. To address these problems, we conducted a review that dissociates research on digital C2C platforms and developed a theoretical framework that explains platform value creation based on the congruence between three platform mechanisms (i.e., activation, support, and assurance), and requirements of the exchange. We further outline rationales that explain congruence between platform strategy and the external environment. Based on the theoretical framework, we offer an actionable knowledge base for digital C2C platforms and outline how it can inform future research, as well as platform managers.

Keywords: Digital platform, C2C platform, consumer platform, sharing, gig work, value creation, platform congruence, framework, literature review.

1 Introduction

Digital C2C (consumer-to-consumer) platforms are the primary drivers through which tech companies such as Airbnb, Uber, and Kickstarter are disrupting established industries. Within the broader literature on digital platforms, a growing research stream focuses on platforms, whose providers leverage and orchestrate external resources to mediate value exchange in networks of external consumers, micro-entrepreneurs, or users (cf., Stabell and Fjeldstad, 1998). These platforms can lead to unprecedented scalability and digital disruption that is of interest to IS practitioners and academics alike (Asadullah, Faik, and Kankanhalli, 2018a; cf., Reuver, Sørensen, and Basole, 2018). At the same time, their inherent complexity can be notoriously difficult to manage, especially when they evolve across contexts (Alaimo, Kallinikos, and Valderrama, 2019; Asadullah, Faik, and Kankanhalli, 2018b).

With research on digital C2C platforms gaining traction in a range of disciplines, the IS field is challenged to identify and communicate its unique contributions to this discourse. For instance, the economics discipline has approached digital platforms from the perspective of two-sided markets (e.g., Rochet and Tirole, 2003), and the computer science discipline offers fundamental technical and architectural insights (e.g., Parnas, 1972) that are applicable to digital C2C platforms.

While the literature on digital C2C platforms is growing, syntheses and integrative frameworks of research findings are lagging behind. From a researcher's perspective, the volume and heterogeneity of papers that are published, seemingly focusing on digital platforms, make it challenging to

distinguish research specifically on *digital C2C platforms* or to gain a transparent view of what IS research has accomplished in this area. What is missing is a review of the state of the art of the literature that coherently integrates what we know to date about digital C2C platforms into a coherent framework. No such comprehensive integration of the state of knowledge on digital C2C platforms is currently available.

Even more significantly, explanations of how platform design mechanisms lead to value creation are fragmented. Lacking sufficient understanding of suitable platform design mechanisms, the practice of implementing mechanisms that are incongruent with a given context has been considered as contributing to high failure rates (Asadullah, Faik, and Kankanhalli, 2018b; Täuscher and Kietzmann, 2017). Dealing with the contextual complexity of digital platforms and understanding the relevant environmental aspects is therefore necessary to explain which platform design mechanisms are congruent, and how they need to be reconfigured when the platform and its environment evolve (Staykova and Damsgaard, 2017). In particular, present research, which is expanding rapidly, lacks an overarching framework offering a theoretical rationale as to why and under which circumstances different platform design mechanisms lead to value (co)creation for consumers.

While extant research has offered insightful analyses of certain platform designs (e.g., Tiwana, 2015b; Tsai and Bagozzi, 2014; S. Ye, Gao, and Viswanathan, 2014), the lack of an overarching frame that considers platforms and their respective exchange requirements arguably restricts the development of an integrated knowledge base. From a perspective of platform managers, insights on effective platform strategies are scattered, and transferability of extant knowledge is non-transparent.

In our view, a review and theory development paper can aptly contribute to addressing the challenges outlined above. The objective of our paper is therefore to *integrate the state of IS research on digital C2C platforms and to advance explanatory knowledge on value creation by developing a framework of platform mechanisms, platform congruence, and value creation.* To achieve this objective, we commence by distinguishing digital C2C platforms from related types of platforms. Next, we outline the methodological procedures of the literature search, selection, and analysis. In the main section, we lay out the theoretical framework and explain how three mechanisms (activation, support and assurance) lead to different types of value creation through congruence with requirements of the consumer exchange. The framework builds on a comprehensive literature search and constitutes a critical step towards understanding platform congruence and value for diverse and evolving C2C platforms. We conclude by discussing opportunities for future research and by outlining how managers of digital C2C platforms can draw on our synthesis to design effective platform strategies.

2 Background

2.1 Types of Digital Platforms

To show how our work relates to extant literature on digital platforms more broadly, we briefly distinguish the levels of granularity and types of platforms that have been discussed in the literature. Figure 1 provides an overview of the literature which is structured accordingly. Adopting a high level of granularity, recent review papers provide broad syntheses of digital platforms (Asadullah, Faik, and Kankanhalli, 2018a), design and governance of platform ecosystems (Schreieck, Wiesche, and Krcmar, 2016), and platform evolution (Asadullah, Faik, and Kankanhalli, 2018b; Staykova and Damsgaard, 2017). On the detailed level, there are several review papers of platforms serving specific purposes, such as mobility (Willing, Brandt, and Neumann, 2017) or knowledge work (Wagner and Prester, 2019). In a thought-provoking commentary on "what we don't know about platforms" (p.129), Reuver, Sørensen, and Basole (2018) offer further insights on digital platforms, infrastructures, and ecosystems. They notice the heterogeneity and complexity when comparing studies that fall into the broad scope of *digital platforms*. The ensuing tasks of *scoping the discourse* on (subtypes of) digital platforms such as digital C2C platforms, and improving *clarity of the core concepts*, e.g., by deriving corresponding criteria, are stipulated for future research.

We situate *digital C2C platforms* at the intermediate level, on which prior research has distinguished platform archetypes such as intra-organizational and inter-organizational platforms (cf., Gawer, 2014). This level has received limited research attention compared to the overarching discourse on digital platforms and the more specific types of platforms. Filling the evident gap in the literature on digital platforms, we situate our review of digital C2C platforms at the intermediate level, covering sub-types such as crowdsourcing, mobility, and app platforms. The advantage of examining the phenomenon at this intermediate level is that there is less heterogeneity compared to the overarching discourse on digital platforms, and more variance in the types of exchange compared to the research on more focused types of platforms.

Overall definitions and conceptions of digital platforms have been proposed from technical, socioeconomic, or ecosystem perspectives (Asadullah, Faik, and Kankanhalli, 2018a, 2018b; Reuver, Sørensen, and Basole, 2018). From a technical perspective, digital platforms are often conceived of as an *extensible codebase*, which provides inter-operability and shared core functionality for apps and modules (Reuver, Sørensen, and Basole, 2018; Tiwana, Konsynski, and Bush, 2010, p. 675). From a socioeconomic perspective, digital platforms are conceived of as two-sided markets facilitating the exchange of value (e.g., information, goods, and services) between actors (cf., Staykova and Damsgaard, 2017). From an ecosystem perspective, research on digital platforms is embedded in broader phenomena, e.g., related to inter-platform competition, platform multi-homing, and interactions with the external environment (spillovers). These conceptions illustrate the different foci adopted by extant research on the broader phenomenon of digital platforms (cf., Gawer, 2014).

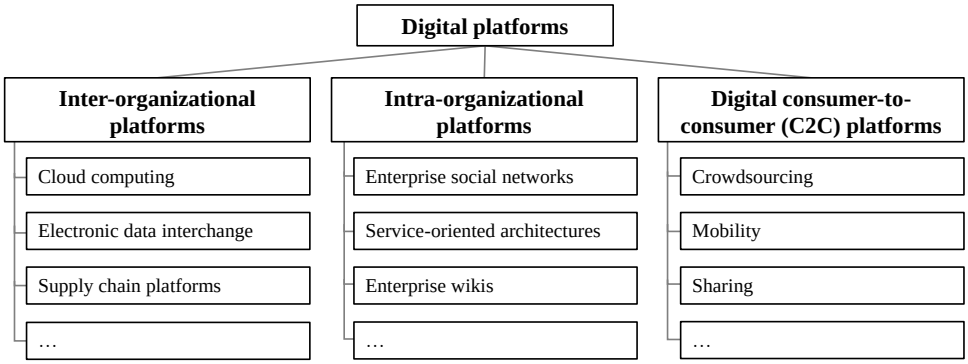

Figure 1. Types of Digital Platforms (adapted from Gawer (2014)).

2.2 Digital C2C Platforms

Consistent with the literature, we conceive digital C2C platforms as platforms relying on digital technology and centralized governance to mediate the exchange of non-infrastructural value in networks of external consumers (Gawer, 2014; G. Parker and Alstyne, 2008; Reuver, Sørensen, and Basole, 2018; Stabell and Fjeldstad, 1998; Wagner and Prester, 2019). Such platforms constitute a digital technology, thus enabling increased efficiency of the mediation process and the corresponding potential for rapid scalability (J. C. Huang, Henfridsson, Liu, and Newell, 2017). A further property of digital platforms is the extensibility of the platform artifact (e.g., Tiwana, 2015a). These opportunities of leveraging platform capabilities for unprecedented generativity, are contingent on inherent properties of digital technology.

Digital C2C platforms cannot be distinguished based on their internal and technological characteristics alone. Instead, beyond their internal properties, digital platforms need to be distinguished in terms of the actors they connect, the value that is exchanged, and the mediating connection with the platform. Digital C2C platforms connect consumers or micro-entrepreneurs that are external to the organization of the platform provider (Hevner and Malgonde, 2019). This implies that consumers are, in economic terms, independent actors who are not bound by formal organizational control, that participation is voluntary, and that excluding consumers from the platform is one of the strictest measures at the

disposal of platform providers. On digital C2C platforms, value is created collaboratively and delivered by multiple contributing actors (Reuver, Sørensen, and Basole, 2018). Contrary to traditional views of two-sided markets, the value creation process is thus not separate from the market where value is exchanged. Instead, value is co-created through consumer interactions on the platform, often coinciding with its exchange, which goes beyond the provision of infrastructural value, such as data connections or basic payment services. Thus, value creation on digital C2C platforms is a multi-dimensional process that produces not only the instrumental value of consuming a product or service, but also interactional value during the consumers' engagement with the platform and social value as part of the consumers' relationship with a community (Priem, 2007; Schau, Muñiz Jr, and Arnould, 2009). Finally, digital C2C platforms are governed and operated by a central intermediary (Gol, Stein, and Avital, 2019; Stabell and Fjeldstad, 1998). Centralized intermediaries can coordinate the exchange by counteracting non-conducive behavior, e.g., by excluding particular actors based on reputation systems (cf., Basili and Rossi, 2020), and by facilitating conducive behavior, e.g., by subsidizing particular market sides (Kung and Zhong, 2016; cf., Stummer, Kundisch, and Decker, 2018). Although there is increasing interest in decentralized governance models enabled by peer-to-peer and blockchain based architectures, research has predominantly focused on centralized governance as there are few platforms that actually implement decentralized models (Gol, Stein, and Avital, 2019). These conceptual distinctions between different types of digital platforms and the definition of digital C2C platforms guided the literature review, as outlined below.

3 Review Methodology

Our review aims at synthesizing the existing state of knowledge on digital C2C platforms, as well as integrating the knowledge on how such platforms create value into a theoretical framework (Schryen, Wagner, and Benlian, 2015). Thus, we conducted a state-of-the-art theory development review dedicated to the question of how value creation on digital platforms can be conceptualized. Accordingly, we used a theoretical review strategy (Paré, Trudel, Jaana, and Kitsiou, 2015) to analyze the literature in our search for themes and patterns with respect to value creation on digital platforms. We considered systematicity and transparency when designing and reporting the literature search (Paré, Tate, Johnstone, and Kitsiou, 2016), following recommended methods (Okoli, 2015; Webster and Watson, 2002). The scope is not limited in time, but restricted to papers published in English and in IS outlets. Our rationale for focusing on the IS literature lies in its key position at the intersection of social and technical phenomena. Digital platforms are considered a key phenomenon of the discipline (Reuver, Sørensen, and Basole, 2018; Tiwana, Konsynski, and Bush, 2010), value creation through IT is a mainstay topic in IS research (Melville, Kraemer, and Gurbaxani, 2004; Schryen, 2013), and digital, platform-driven transformation has been a persistent topic in the IS discourse (Vial, 2019). The PRISMA chart (Figure 2) summarizes the flow of papers through the search and selection phases.

Our search strategy covers a database search of Google Scholar and the AIS library, a table-of-content scan of the AIS Senior Scholars' Basket of Journals and the first iteration of a backward search. We focused on the top-21 IS journals identified by Lowry et al. (2013) to identify high-quality journal papers. Search terms were *"digital platform"*, *"two-sided market"*, *"multi-sided market"*, or *"intermediary market"*. We further cross-checked references of published review papers in a complementary search.

In the first screen, we considered 8,086 papers and excluded 7,644 based on the titles and abstracts. In the second screen, we analyzed the remaining 442 full-text papers, applying four criteria. First, papers needed to focus on a *digital* platform. Second, a central intermediary was required. Third, we retained papers focusing on the exchange between consumers, excluding the provision of infrastructure, such as internet connections. Fourth, we exclude platforms on which the user base does not primarily consist of consumers, such as intra-organizational platforms in which actors are typically subject to hierarchical control, or platforms focusing on small and medium-size enterprises or other actors. Overall, our first sample contains 186 papers on digital C2C platforms. In this sample, we excluded 92

papers not dedicated to the question of how platforms create value for consumers, resulting in a final sample of 94 papers.

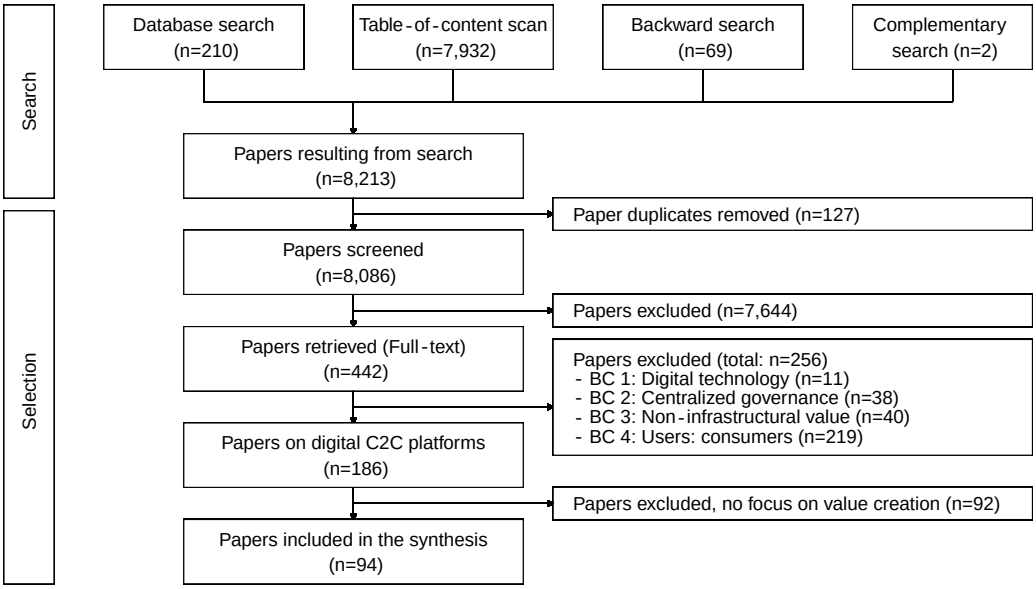

Figure 2. Flow Diagram: Search & Selection.

After the screening, we systematically examined the findings in the papers. We analyzed the literature using qualitative inductive coding techniques (Hsieh and Shannon, 2005; Wolfswinkel, Furtmüller, and Wilderom, 2013). Consistent with qualitative research methodologies, our coding was highly iterative, and entailed us moving back and forth to revise our codes as our analysis progressed. We began by identifying design elements and more abstract strategic mechanisms mentioned in the papers. We then grouped similar codes and ultimately differentiated between three overarching platform design mechanisms and various exchange characteristics critical to the design of those mechanisms. Finally, we analyzed the corresponding value propositions for consumers enabled by the three mechanisms. We followed the same open coding protocol as for the identification of the mechanisms. We continually discussed our codes, constantly comparing them to the findings in the papers, to ensure that our emerging code structure stayed true to the existing literature and accurately represented the mechanisms described in prior research. Synthesizing insights in this way, we then moved on to develop a theoretical framework of platform congruence to integrate the state of the art of digital C2C platform research and develop explanatory knowledge. Aiming to explain the value creation process on digital C2C platforms, we used a process perspective as a "sensitizing device" when organizing the platform design mechanisms into our theoretical framework (Klein and Myers, 1999). Due to page restrictions, Tables 1 - 3. and our synthesis cite our sample selectively as opposed to comprehensively (Cooper, 1988).

4 A Framework of Platform Mechanisms, Congruence and Value Creation

The theoretical framework that emerged from our inductive synthesis of extant research conceives value creation for and by the individual consumers as being driven by the congruence of the platform design with the respective requirements of the exchange (Figure 3). The framework aligns with the lifecycle of consumers on digital platforms, from registration and active participation to satisfaction with the exchange or frustration, which may eventually lead to users abandoning the platform (cf., Van de Ven and Poole, 1995). Each phase implies a focus on distinct dimensions of value, covering participation, satisfaction, and the reduction of frustration (i.e., two distinct sides of the same coin). Following the literature, we further include the participation-performance link (Roberts, Hann, and

Slaughter, 2006) as well as a simplified recursive feedback link from (perceived) performance on the decision to continue participation (Lowry, Gaskin, and Moody, 2015). Consistent with the strategic role of intermediaries in value networks (Stabell and Fjeldstad, 1998), the platform design concurrently mirrors the synchronic instantiation of lifecycles of consumers, and corresponds to three mechanisms: activation, support, and assurance. In the following subsections, we outline how the effect of each mechanism on its associated value dimension depends on its congruence with requirements of the exchange. The underlying notion of congruence resonates with the requirement that enabling technology must suit the context or type of exchange on consumer platforms (cf., Zwass, 2010).

Borrowing from the logic of process theories, the framework builds on the principle of synchronicity (Kouamé and Langley, 2018) to integrate the heterogeneous literature and to dissociate archetypal platform design mechanisms. On the one hand, this means that digital C2C platforms simultaneously operate all three design mechanisms. On the other hand, this means that individual design elements can synchronically instantiate more than one design mechanism. For instance, a reputation system is primarily designed to support users in developing trust in other users, but it can also signal the possibility of exchanging with strangers (Moreno and Terwiesch, 2014), thereby driving active participation (i.e., as an activation mechanism), and simultaneously serve as part of an assurance mechanism, identifying low performers that may be excluded from the platform (Basili and Rossi, 2020). For simplicity, we focus on archetypal examples for each mechanism in the following subsections without reiterating the synchronic correspondences across phases. We revisit this principle of synchronicity in the discussion section to explain how it enables the derivation of research models from the framework.

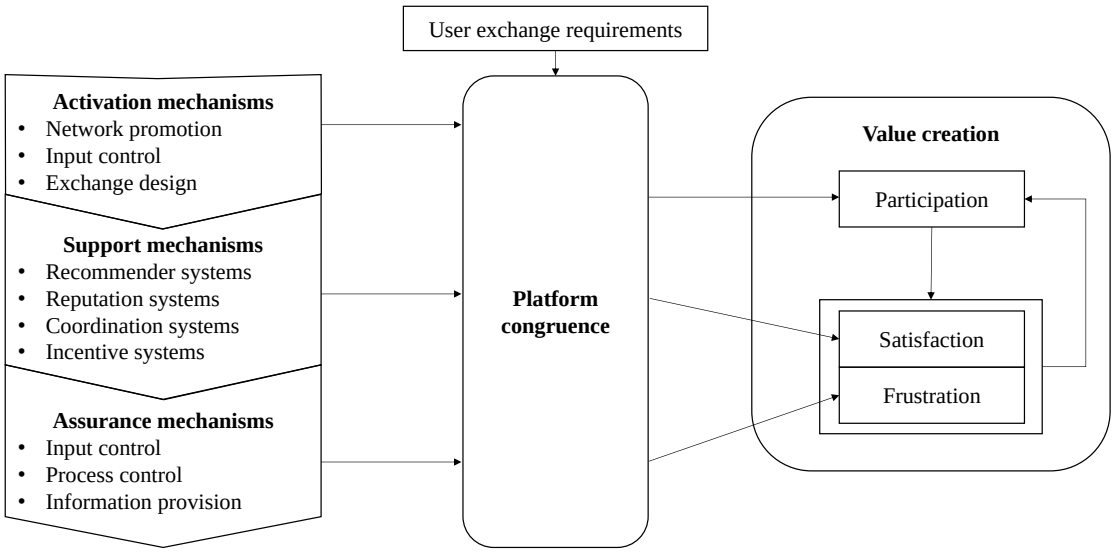

Figure 3. Framework of Platform Mechanisms, Congruence and Value Creation.

Before proceeding with the individual mechanisms, clarification of the boundaries of our framework is warranted. In line with the focus of our inductive analyses, the framework excludes several aspects related to digital C2C platforms from consideration. First, it focuses on value creation for individual users as opposed to the platform provider, whose return depends on additional factors such as competition between platforms or the ability to extract a share of the value generated for consumers. Second, it assumes that the platform provider adopts an active role as an intermediary of a value network (Stabell and Fjeldstad, 1998), thereby excluding decentralized platforms as well as emergent user communities. Third, the existence of opportunities for value creation is exogenous to the framework. It does not explain how such opportunities (e.g., for sharing platforms) arise but instead focuses on how the elements of existing platforms leverage such opportunities facilitate value (co)creation. Fourth, it focuses on mechanisms as abstract bundles of design elements as opposed to analyzing detailed technical infrastructure (e.g., architectural modularity or decomposition).

4.1 Activation mechanisms

Activation mechanisms refer to the arrangements of platform design elements primarily aimed at regulating initial as well as continued participation and activity across groups of consumers. This means promoting the increased adoption of the platform as well as restricting the participation of users who may cause frustration or harm to others once they become active. In this regard, extant research has primarily analyzed mechanisms for network promotion (cf., Stabell and Fjeldstad, 1998), input control, and the exchange design. For these activation mechanisms, platform congruence is determined by requirements derived from characteristics of the platform market, the need for creating trust between consumers, and individual consumer preferences (cf., Table 1).

Analyses of targeted network promotion are particularly salient for platforms operating multi-sided markets with network effects, i.e., with the utility of one market side depending on the availability and activity of the other market side (G. Parker and Alstyne, 2008). When launching a digital platform, these dependencies often lead to a chicken-egg dilemma in which users on each market side hesitate to commit to the platform, waiting for other users to engage first (Stummer, Kundisch, and Decker, 2018). Considerable research has been dedicated to different network promotion approaches aimed at overcoming this dilemma and ensuring optimal participation on all market sides (M. Lin, Li, and Whinston, 2011). The predominant building blocks of network promotion include pricing mechanisms and incentives (Garnefeld, Iseke, and Krebs, 2012; M. Lin, Li, and Whinston, 2011) as well as promoting opportunities of switching sides among active users (Stummer, Kundisch, and Decker, 2018).

Participation of consumers is further regulated by input control systems, which have two main effects. On the one hand, screening and excluding users, e.g., on the basis of background checks or the verification of driving licenses on sharing and mobility platforms (M. Lee, Choi, and Lee, 2019), prevents specific users from actively engaging in the exchange. On the other hand, such input control signals trustworthiness of other users and the platform, thereby creating the opportunity to trust strangers and interact with them (Moreno and Terwiesch, 2014).

Focusing on sustaining activity of registered users, the third mechanism pertains to the exchange design. Recognizing the requirement to continuously ensure accurately coordinated activity on the respective market sides, von Briel and Davidsson (2019) illustrate how platforms can leverage four types of digital nudges: triggers, maintainers, simplifiers, and quantifiers. Further research addresses the question of how the design of the exchange can maintain and augment trust in other users. For instance, this pertains to overcoming cultural barriers (Burtch, Ghose, and Wattal, 2014), the initial lack of entrepreneurial legitimacy (Ingram Bogusz, Teigland, and Vaast, 2019), or the lack of trust in sharing economy platforms (Mittendorf, Berente, and Holten, 2019). Overall, trust in the platform may not suffice when the exchange involves real-world interactions, financial investments, or longer commitments; in such cases, trust in specific users is required (Mittendorf, Berente, and Holten, 2019). Finally, continued activity on digital C2C platforms is driven by congruence of the exchange design with a wide range of consumer preferences. For instance, these include ease of technical development and integration in app platforms (Benlian, Hilkert, and Hess, 2015; Kankanhalli, Ye, and Teo, 2015), the need for decent work conditions in gig economy platforms (H. Ye and Kankanhalli, 2018), or distinct motives on social network platforms (Salehan, Kim, and Kim, 2017).

Ultimately, activation mechanisms create value through growth of the user base and optimizing participation on both market sides. User participation, i.e., the registration on the platform, is a necessary precondition for engaging in the exchange with a higher number of active users on the platform inherently creating value through network effects (Eisenmann, Parker, and Van Alstyne, 2006; G. G. Parker and Alstyne, 2005). At the same time, platform providers also regulate and restrict the growth of the user base through selection and screening mechanisms. To facilitate the scaling of the platform, providers of multi-sided market platforms have to maintain an optimal balance between users on the respective market sides. In this regard, promoting opportunities for switching from the demand to the supply side and vice versa has been proven effective for creating value from an optimal

user balance (Schirrmacher, Ondrus, and Kude, 2017). Finally, maintaining activity and engagement between consumers remains an ongoing challenge for platform providers.

		User exchange requirements		
		Market characteristics	Trust	Consumer preferences
Platform design mechanisms	Network promotion	M. Lin, Li, and Whinston (2011)	–	–
	Input control	Thies, Wessel, and Benlian (2018)	Mittendorf (2018)	–
	Exchange design	–	Benlian, Hilkert, and Hess (2015), Burtch, Ghose, and Wattal (2014), Du and Mao (2018), Mittendorf, Berente, and Holten (2019), K.-Y. Huang, Chengalur-Smith, and Pinsonneault (2019), Ingram Bogusz, Teigland, and Vaast (2019)	Heimbach and Hinz (2018), K.-Y. Huang, Chengalur-Smith, and Pinsonneault (2019), Kankanhalli, Ye, and Teo (2015), H.-W. Kim, Kankanhalli, and Lee (2018), Ryu and Kim (2018), Salehan, Kim, and Kim (2017), H. Ye and Kankanhalli (2017), H. Ye and Kankanhalli (2018), Zheng, Xu, Zhang, and Wang (2018)

Table 1. Activation mechanisms.

4.2 Support Mechanisms

Support mechanisms refer to bundles of platform design elements primarily aimed at facilitating the exchange and increasing the satisfaction of users. Extant research has been dedicated to recommender systems, reputation systems, coordination systems and incentive systems, which address requirements related to the direction of attention, the maintenance of trust between users, and the support of specific interactions (cf., Table 2).

Recommender systems guide users through the first steps required for a satisfactory exchange by filtering the myriad of possibilities and identifying those interactions most likely to satisfy consumer requirements and preferences. For instance, such recommender systems support the selection of appropriate tasks on crowdsourcing platforms (Mo, Sarkar, and Menon, 2018) or leverage data on preferences and decisions of other users to derive recommendations in a collaborative filtering setting (Guo, Zhang, Fan, and Li, 2018). Other forms of recommender systems can be found in strategic endorsements of platform products (such as apps) with corresponding spillover effects on other users (Liang, Shi, and Raghu, 2019).

Requirements to develop trust in other users are typically addressed by reputation systems. Over the course of repeated interactions with different parties, reputation systems can contribute to improved satisfaction by collaborative sanctioning of underperforming users over time (Jøsang, Ismail, and Boyd, 2007). Corresponding feedback mechanisms capture several facets, such as the behavior of users (Du and Mao, 2018) or their abilities (Hong and Pavlou, 2017). Such reputation systems, which are an essential means to reducing information asymmetries and alleviating adverse selection (Gefen and Carmel, 2008), may face challenges such as the prevalence of perfect ratings, which do not adequately signal differences in user reputation (cf., Akerlof, 1978; Geva, Barzilay, and Oestreicher-Singer, 2019), or biases of disproportionately flocking towards users with the highest reputation (Taeuscher, 2019).

Coordination systems are designed to regulate the exchange once initiated. They typically implement algorithmic management, facilitating the exchange based on improved matching and control (Möhlmann, Zalmanson, Henfridsson, and Gregory, forthcoming). With regard to the guidance of users' attention, research has analyzed the nature and possible countermeasures to salience bias in crowdsourcing contests (H. C. B. Lee, Ba, Li, and Stallaert, 2018) as well as the benefits of drawing

funders' attention to projects approaching the funding threshold on crowdfunding platforms (Li and Wang, 2019). Furthermore, initial research has explored the role of coordination systems in sustaining and augmenting trust between users. Specifically, research conducted by Du and Mao (2018) suggests that supporting users with requirements analysis services, periodical evaluation, and harmonious conflict resolution reduces requirements and progress uncertainty. A plethora of research contributions has been dedicated to the use of coordination systems in addressing specific interaction requirements of the exchange. For example, this pertains to the support of crowdwork through measures such as task management and quality control (Gol, Stein, and Avital, 2019), and the support of developers through openness of app platforms (Benlian, Hilkert, and Hess, 2015; G. Parker and Alstyne, 2008). In social networks and content generation platforms, key contributions have focused on facilitating knowledge sharing (Lu, Singh, and Sun, 2017) and validation (Meservy, Jensen, and Fadel, 2014). Furthermore, platforms mediating physical interactions between users have to address the requirement for accurate spatio-temporal matching between supply and demand, for example by designing job-dispatch algorithms (Tan, Tan, Lu, and Land, 2017) or by installing cyber-physical access mechanisms, which increase users' flexibility (Trang, Busse, Schmidt, Falk, and Marrone, 2015).

		User exchange requirements		
		Attention	Trust	Interactions
Platform design mechanisms	Recommender systems	K. Kim and Viswanathan (2019), Liang, Shi, and Raghu (2019), Mo, Sarkar, and Menon (2018), Shen, Hu, and Ulmer (2015), Singh, Tan, and Mookerjee (2011), Song, Tang, and Huang (2019), Thies, Wessel, and Benlian (2016), S. Ye, Viswanathan, and Hann (2018)	–	–
	Reputation systems	–	Du and Mao (2018), Gol, Stein, and Avital (2019), Hong and Pavlou (2017), Jøsang, Ismail, and Boyd (2007)	–
	Coordination systems	H. C. B. Lee, Ba, Li, and Stallaert (2018), Li and Wang (2019)	Du and Mao (2018)	Benlian, Hilkert, and Hess (2015), Goel, Johnson, Junglas, and Ives (2011), Gol, Stein, and Avital (2019), Lu, Singh, and Sun (2017), Meservy, Jensen, and Fadel (2014), Moqri, Mei, Qiu, and Bandyopadhyay (2018), G. Parker and Alstyne (2008), Zheng, Xu, Hao, and Lin (2018)
	Incentive systems	Jabr, Mookerjee, Tan, and Mookerjee (2014), Kuang, Huang, Hong, and Yan (2019), Shen, Hu, and Ulmer (2015)	–	Basili and Rossi (2020), Burtch, Ghose, and Wattal (2016), Zimmermann, Angerer, Provin, and Nault (2018)

Table 2. Support mechanisms.

Complementing coordination systems, platforms further employ incentive systems to influence the behavior of users. Pricing mechanisms are a classical means to ensuring such coordination between market sides. For example, Zimmermann, Angerer, Provin, and Nault (2018) suggest a new pricing model for sharing platforms, in which platform intermediaries vary their fees for the respective market sides according to conditions, such as fluctuations in sharing price, usage capacity, and purchase price, in order to ensure market clearance and associated benefits for users. In social network and knowledge sharing communities, the strategic design of recognition mechanisms has shown to be effective in improving quality (Jabr, Mookerjee, Tan, and Mookerjee, 2014), in creating spill-over effects through content seeding (Kuang, Huang, Hong, and Yan, 2019), and in stimulating reviews of niche products (Shen, Hu, and Ulmer, 2015). Finally, the need for close spatio-temporal coordination in mobility platforms has been approached by means of gamification, reward systems (Tan, Tan, Lu, and Land, 2017), and linking renumeration to compliance with directions set by the platform (Basili and Rossi, 2020).

Support mechanisms create value through a range of objective and perceived measures as well as through coordination and market clearance mechanisms. With regard to value creation through improvements in effectiveness and efficiency, the literature refers to the lowering of transaction and search costs (Mo, Sarkar, and Menon, 2018; Snir and Hitt, 2003), and the increase of operational efficiency (Allon, Bassamboo, and Çil, 2012). Similarly, ensuring platform availability and adequate handling of volume and frequency of the exchange have been described as value propositions of the platform. More subjective measures of value have been explored under the notion of perceived usefulness, quality of the exchange and overall satisfaction (Benlian, 2015). Finally, to improve ongoing market interactions and consequently derive value from better clearance and coordination, the literature has studied different mechanisms for facilitating continuous reciprocal interactions on the platform (Stabell and Fjeldstad, 1998; S. Ye, Viswanathan, and Hann, 2018).

4.3 Assurance Mechanisms

Assurance mechanisms refer to the arrangements of platform design elements primarily aimed at preventing user frustration, i.e., a key driver of platform exit (Taylor and Joshi, 2019; Täuscher and Kietzmann, 2017). In particular, such frustrations may be caused by the failure of assurance mechanisms to ensure that the independent participants deliver satisfactory levels of quality (Täuscher and Kietzmann, 2017). Extant research has focused on three assurance mechanisms, input control, process control, and information provision, which depend on requirements for safety, privacy, and fairness (cf., Table 3).

Input control, as the most restrictive mechanism, is the dominant assurance mechanism for safety requirements. These measures simultaneously correspond to an activation mechanism. While most approaches rely on relatively static criteria, such as verified driving licenses and background checks (Mittendorf, 2018), initial research has been dedicated to dynamic input control as assurance mechanisms. Specifically, Frey, Trenz, and Veit (2017) describe how IT can support platforms in identifying and excluding users who behave inappropriately, try to circumvent security measures, or violate platform standards.

Process control, as the second main assurance mechanism, aims at regulating interactions rather than excluding users. It has been considered appropriate for privacy and fairness requirements in particular. Process control measures have been studied as means to prevent users from gaming reputation systems (S. Ye, Gao, and Viswanathan, 2014), manipulating reviews (Kumar, Venugopal, Qiu, and Kumar, 2018), or to identify and counteract fraudulent or malicious behavior (Siering, Koch, and Deokar, 2016; Suh, Lee, Suh, Lee, and Lee, 2018).

Finally, there are less restrictive assurance mechanisms, which are summarized under the term *information provision*. With regard to safety, this can involve providing users with information on potentially fraudulent participants without categorically preventing such interactions (Gregg and Scott, 2006). With regard to privacy requirements, this could involve nudges to reconsider sharing private information (Cao, Hui, and Xu, 2018) or sensitizing users about the size and nature of the audience to

which they are about to disclose information (Shang, Wu, and Li, 2017). With regard to fairness requirements, feedback and rating mechanisms have been studied as means to informing users about the risk of underperforming users (Du and Mao, 2018) or the trustworthiness of content (A. Kim, Moravec, and Dennis, 2019).

Assurance mechanisms create value primarily through effective management of exchange incidents and governance of issues relating to safety, privacy, and fairness. For instance, controlling user behavior and monitoring the exchange to identify fraudulent behavior or policy violations can lead to an overall improved consumer experience and increase the quality of the exchange (Suh, Lee, Suh, Lee, and Lee, 2018). Other forms of value can be derived by ensuring that the exchange is fair for users on both the demand and supply side (Basili and Rossi, 2020). Fairness relates to principles of fair dealing and general fair treatment of both market sides who aim to develop trust and maintain exchange relationships over time. In this regard, the literature refers to fairness as covering decency, integrity, and ethics in platform exchange. For instance, mechanisms of informing users through feedback loops and sensitizing nudges (Shang, Wu, and Li, 2017; von Briel and Davidsson, 2019) can improve credibility of the platform provider and raise users' awareness of privacy and fairness related issues leading to higher user retention.

		User exchange requirements		
		Safety	Privacy	Fairness
Platform design mechanisms	Input control	Mittendorf (2018)	–	–
	Process control	–	Cao, Hui, and Xu (2018), S. Lin and Armstrong (2019), Teubner and Flath (2019)	Basili and Rossi (2020), Kumar, Venugopal, Qiu, and Kumar (2018), Siering, Koch, and Deokar (2016), Suh, Lee, Suh, Lee, and Lee (2018), S. Ye, Gao, and Viswanathan (2014)
	Information provision	Gregg and Scott (2006)	Cao, Hui, and Xu (2018), Shang, Wu, and Li (2017)	Du and Mao (2018), A. Kim, Moravec, and Dennis (2019)

Table 3. Assurance mechanisms.

5 Discussion

5.1 Implications for Future Research

Our review of digital C2C platforms offers a high-level framework explaining value creation based on the congruence between platform mechanisms and exchange requirements. We highlight two major implications for future research. First, it makes a first step toward integrating the proliferating literature on various types of digital C2C platforms, including mobility, crowdfunding, sharing, app development, and gig work platforms. We believe the notion of platform congruence as dependent on distinct mechanisms and exchange requirements, as well as its effect on distinct dimensions of value, can serve as a blue-print for literature reviews at the more granular levels of digital C2C platforms. Platforms displayed in Figure 1 could serve as a starting point for corresponding review papers.

Furthermore, our theoretical framework offers a starting point to derive and test research models (Dubin, 1969; Ostrom, 2005). In this regard, it may be instructive to consider both platform-mechanism-centric and value-dimension-centric models. For example, research models could be dedicated to value dimensions, such as user frustration, and assemble antecedents from synchronic platform mechanisms (see Figure 4 a). On mobility platforms, this could pertain to process control, which subjects users to predefined procedures and rules of the exchange – e.g., preventing malicious users from gaming the system and taking advantage of others – (restriction effect), and incentive systems, which encourage users to initiate supporting tasks (initiative effect). Accounting for the

congruence with exchange requirements, perceptions of urgency in users requesting a ride could be hypothesized to strengthen both restriction and initiative effects as a moderator variable.

Similarly, mechanism-centric models could be dedicated to reputation systems design in exchanges requiring strong trust among users (see Figure 4 b). Accounting for platform congruence by setting stricter boundary conditions, this research model focuses on exchanges that are high-dimensional, i.e., require greater financial investments, involve more social interactions, and extend over longer durations (cf., Mittendorf, Berente, and Holten, 2019). In such exchanges, reputation systems signal the possibility of developing trust in other users and engaging in different types of exchanges, and thereby facilitate participation (signaling effect). They further allow users to make informed selection decisions when deciding whom to trust on the platform (selection effect) and they allow platform providers to exclude users who repeatedly cause frustration to others (exclusion effect). Finally, researchers may consider participation as an antecedent of satisfaction or frustration, following the motivation-participation-performance rationale (Roberts, Hann, and Slaughter, 2006).

The two examples demonstrate different ways of capturing congruence with the exchange requirements. The possibility to derive various research models from our theoretical framework underlines its generativity. Furthermore, it can be used as a starting point to contrast research models across contexts involving different exchange requirements, offering potential avenues to theory elaboration (Fisher and Aguinis, 2017). While the examples for instantiated research models in Figure 4 focus on variance models, we believe that there are also opportunities to derive contextual process models from our framework.

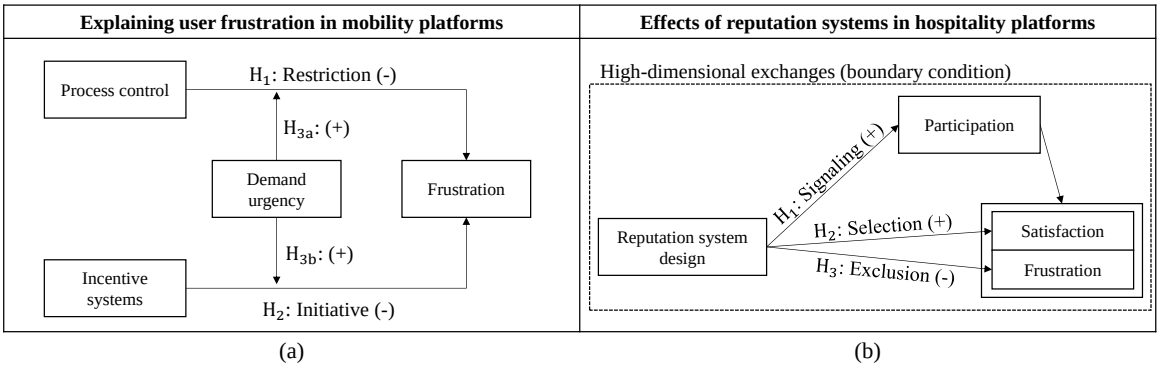

Figure 4. Examples for instantiated research models.

5.2 Implications for Practice

Our work has practical implications for platform managers confronted with complex options of shaping platform design mechanisms. Figure 3 offers a mental model for understanding, analyzing, and evaluating platform design elements and mechanisms. Platform managers can further refer to our analysis of platform mechanisms and their association with value creation according to varying exchange requirements offered in Tables 1 - 3. These tables resemble the outcomes of a realist review aimed at understanding *what works for whom in which circumstances* (Denyer and Tranfield, 2006), and thereby provide an actionable knowledge base that makes academic insights accessible in a pragmatic way. These insights offer a repertoire from which platform managers can orchestrate different elements of activation, support, and assurance mechanisms. For instance, platform strategies intended to enter new consumer segments with distinct demographic characteristics and technical barriers, should consider platform mechanisms that have been deemed effective in related segments (e.g., Mittendorf and Ostermann, 2017). Likewise, platform expansion, such as Uber offering food delivery services, and Airbnb offering guided experiences, may not always succeed with the same platform mechanisms, but require mechanisms congruent with the requirements of the new type of exchange.

5.3 Limitations

Our work should be interpreted in light of its limitations. First, the literature search may have missed relevant papers due to the selection of keywords. However, the results gained from additional search techniques may be compensated by the extensive table-of-content searches and the complementary search. Second, we applied strict inclusion criteria. Although we are confident that the criteria have been applied reliably, involving careful consideration of borderline cases, this should be confirmed by a parallel independent paper selection (Templier and Paré, 2018). Finally, in developing the framework, we broadly considered evidence and conceptual knowledge. Therefore, our propositions should be carefully interpreted as hypothetical, conjectural knowledge aimed at guiding research.

5.4 Concluding Remarks

In conclusion, our review and theory development paper offers three contributions. First, we distinguish digital C2C platforms as the type of platform through which firms such as Airbnb, Uber, and Kickstarter have disrupted a range of industries. We feel that our efforts to explicitly define and distinguish the nature of *digital C2C platforms* contributes to disentangling the discourse at the intermediate level, i.e., between the overarching phenomenon of *digital platforms* and specific platforms, such as car-sharing or crowdfunding platforms. Our paper enables a more nuanced consideration of platform types and thereby addresses calls for "clarity of the core concepts" and "better scoping of the discourse" (Reuver, Sørensen, and Basole, 2018, p. 127).

Second, we offer a theoretical framework explaining value creation based on the platform congruence between the activation, support, and assurance mechanisms and the requirements of the exchange. Overall, the framework further offers a useful structure for synthesizing extant knowledge and identifying congruent platform mechanisms that lead to higher value creation. Our synthesis further offers an actionable knowledge base for practice. Taken together, the framework and the synthesis of extant research are an important step towards supporting platform managers in identifying potential mechanisms, better vetting the transferability of platform mechanisms between contexts, and thereby avoiding user exit and platform failure (Asadullah, Faik, and Kankanhalli, 2018b; Täuscher and Kietzmann, 2017).

Finally, we outline how future research can build on our framework to advance and test novel theoretical models for particular types of exchanges, and consumers. We hope that this review and theory development paper, by offering a transparent overview of extant research, enhances the visibility of IS research contributions and clarifies how the IS field has contributed to the discourse on digital C2C platforms. Ultimately, we envision joint research efforts in which IS, economics, and computer science contribute their unique strengths to inform future research, managerial practice, as well as the societal discourse.

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