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ABSTRACT

What are the similarities and differences between crowdsourcing and sharing economy? What factors influence their use in developing countries? In light of recent developments in the use of IT-mediated technologies, such as crowdsourcing and the sharing economy, this manuscript examines their similarities and differences, and the challenges regarding their effective use in developing countries. We first examine each individually and highlight different forms of each IT-mediated technology. Given that crowdsourcing and sharing economy share aspects such as the use of IT, a reliance on crowds, monetary exchange, and the use of reputation systems, we systematically compare the similarities and differences of different types of crowdsourcing with the sharing economy, thus addressing a gap in the current literature. Using this knowledge, we examine the different challenges faced by developing countries when using crowdsourcing and the sharing economy, and highlight the differences in the applicability of these IT-mediated technologies when faced with specific development issues.

Keywords: crowdsourcing, sharing economy, development, developing countries, virtual labor markets, tournament crowdsourcing, open collaboration, IT-mediated crowds, asset hubs, peer-to-peer sharing networks

Introduction

Crowdsourcing is the IT-mediated engagement of crowds for the purposes of problem-solving, task completion, and idea generation and production (Brabham, 2008; Howe, 2006, 2008). Crowdsourcing encompasses various types of platforms, such as virtual labor markets (VLMs), tournament crowdsourcing (TC), and open collaboration (OC), which each have different roles and characteristics (Estellés-Arolas & González-Ladrón-de-

Guevara, 2012; Prpić, Taeihagh, & Melton, 2015). Along with the growth of crowdsourcing, another IT-mediated technology in the form of the sharing economy is rapidly being developed. "Sharing economy" is an umbrella term referring to the practices of sharing, exchange, or rental of goods and services to others through IT without the transfer of ownership. The sharing economy promises to increase efficiency and effectiveness by reducing transaction costs and increasing the rate of utilization of goods and services. It has had a transformative effect on how goods and services are provided (Goudin, 2016; Schor, 2014; Welsum, 2016).

Both crowdsourcing and the sharing economy are becoming increasingly popular (Cohen & Kietzmann, 2014; Lehdonvirta & Bright, 2015; Zervas, Proserpio, & Byers, 2016), but despite their rapid adoption and development there are gaps in the literature. These IT-mediated technologies improve efficiency and decrease transaction costs and information asymmetry, and share similarities in their use of IT, reliance on crowds, monetary exchange, use of reputation systems, etc. However, the literature in each domain tends to ignore the other or treats it as a singular form. Moreover, at times a platform is categorized as both a sharing economy platform and a crowdsourcing platform by different scholars. For instance, scholars distinguish between Amazon MTurk and TaskRabbit based on whether the task can be performed as a virtual service that can be executed online or whether a physical service needs to be performed locally (Aloisi, 2015; De Groen, Maselli, & Fabo, 2016). However, there are many instances where both of these platforms have been categorized as part of the sharing economy. This issue is particularly prevalent when the topic under study relates to labor markets or commons.

In this work, we aim to systematically compare the similarities and differences of various types of crowdsourcing and sharing economies across a wide range of criteria to address the gap in the literature and bring about a more nuanced understanding of these IT-mediated technologies. Furthermore, it is being suggested that developing countries can take up crowdsourcing and sharing economy platforms to address problems that are particular to development. In practice, this can be difficult to achieve because developing countries face unique and specialized problems, and our knowledge about the various models of IT-mediated technologies is incipient. Thus, decisions are made by the marketplace despite or beyond the influence of policymakers. The benefit of a more nuanced understanding of these IT-mediated technologies for developing countries is that industry and policymakers can work together more effectively to leverage the new potential of

applying IT-mediated technologies such as crowdsourcing and sharing economy for achieving development objectives while ensuring that they are implemented in ways that maximize positive impacts and minimize negative side effects. This article thus suggests which forms would be more appropriate to which types of development issues, with particular focus on issues relating to mobile and online activities, productivity, and innovation as well as legal and governance challenges.

In the next section, we provide a general overview before examining different types of sharing economy and crowdsourcing in the third section. Given that the sharing economy and crowdsourcing share characteristics we then systematically compare the two in the fourth section. Then, drawing on this understanding, we examine different types of developing countries and focus on the challenges they face in regard to crowdsourcing and the sharing economy in the fifth section, followed by concluding remarks in the sixth section.

Background

The Sharing Economy

The sharing economy is described as a transformative and disruptive economic model in which the consumption of physical goods, assets, or services is carried out through rental, sharing, or exchange of resources using IT through crowd-based services or intermediates without any permanent transfer of ownership (Belk, 2014; Botsman & Rogers, 2010; Dillahunt & Malone, 2015; Goudin, 2016; Hamari, Sjöklint, & Ukkonen, 2015; Lessig, 2008). This is done to increase efficiency and effectiveness by reducing transaction costs[1] and information asymmetry, particularly for consumers, increase the rate of utilization of goods, recirculation of goods, exchange of services, and sharing of productive assets, as well as increase competition in the marketplace, reduce the complacency of suppliers, and make services that often exist in an informal fashion safer through formalization (Goudin, 2016; Hira & Reilly, 2017; Schor, 2014; Welsum, 2016).

Scholars have repeatedly criticized the term "sharing economy" because it implies altruistic or positive non-reciprocal social behavior that can increase societal trust and increased cooperation between individuals, when in fact the services involved are often fee-paying in nature and involve access to goods or assets that individuals often use for economic benefit (Belk, 2014; Eckhardt & Bardhi, 2015; Hamari et al., 2015).

Crowdsourcing

Crowdsourcing is the IT-mediated engagement of crowds for the purposes of problem-solving, task completion, and idea generation and production in which the dispersed knowledge of individuals and groups is leveraged through a mix of bottom-up innovative crowd-derived processes and inputs with efficient top-down goals set and initiated by an organization (Brabham, 2008; Howe, 2006, 2008). It is continuously evolving and a variety of forms are emerging (for an in-depth review, see Prpić, 2016; Prpić & Shukla, 2016). Crowdsourcing initiatives can be carried out by "propriety crowds" that organizations foster through their own in-house platforms or by using third-party crowdsourcing platforms that provide the required IT infrastructure and "built-in crowds" as a paid service (Bayus, 2013).

In this work, we use the three generalized types of crowdsourcing from the literature that focus on micro-tasking in VLMs, TC, and OC through social media and the web (Estellés-Arolas & González-Ladrón-de-Guevara, 2012; Prpić et al., 2015). These general categorizations are not exclusive or exhaustive but they are useful for examining the general characteristics of different types of crowdsourcing and sharing economy.

Types of Sharing Economy and Crowdsourcing

Both sharing economy and crowdsourcing are umbrella terms and encompass a wide range of IT-mediated technologies which can be classified into different categories based on a diverse set of features and applications. Below we examine various types of sharing economy and crowdsourcing.

Types of Sharing Economy

The sharing economy has the potential to be applied in a diverse range of sectors, which include:[2]

- tourism and hospitality (Guttentag, 2015; Ikkala & Lampinen, 2015);
- mobility and logistics (e.g., car-sharing, ride-sharing, bike-sharing, and on-demand logistics and delivery) (Cannon & Summers, 2014; Cohen & Kietzmann, 2014; Techcrunch, 2015);
- Labor and service platforms (Fraiberger & Sundararajan, 2015; Thompson, 2015);

- food and dining (Hendrickson, 2013; Tanz, 2014);
- goods and equipment (Anderson, 2016; Long, 2013; Morrissey, 2015);
- financial services (Ordanini, Miceli, Pizzetti, & Parasuraman, 2011; Zhang, Datta, & Kannan, 2014); and
- other rapidly developing new areas of application.

This sector-based categorization is perhaps the easiest method of classification but, as Kenney, Rouvinen, and Zysman (2015) point out, sectors are now blurring due to digitization and use of IT platforms.

Belk (2010) suggests the concepts of "sharing in" and "sharing out" as a means of distinguishing between sharing that is similar to family sharing (ownership as common) and sharing with strangers that does not create any attachment or bonds. Demary (2015) reports on Smolka and Hienerth (2014) and their categorization of a sharing economy based on whether transactions are market-mediated or not, while Kostakis and Bauwens (2014) and Oskam and Boswijk (2016) distinguish between types of sharing economy by focusing on whether the sharing economy platform is centrally controlled or open/decentralized and also whether the initiative is for-profit or not. Cheng (2014) further expands the consideration of whether the platform is for-profit or not-for-profit and its distributed or centralized production aspects by also considering whether the application covers offline realms or not. Cheng (2014) makes a distinction between peer-to-peer platforms and other types of sharing economy business models but, as Westerbeek (2016) identifies, an overlap is still present between peer-to-peer platforms and these other types of business model (such as collaborative consumption and the gift economy).[3]

Botsman and Rogers (2010) take a functional approach and distinguish between three types of sharing economy based on whether the business model is: (a) a redistribution market of used or pre-owned goods; (b) a product service system where consumers pay for access to the good as a service rather than purchasing the good; and (c) based on collaborative lifestyles (i.e., involving the sharing of non-physical assets such as time, expertise, and space). Andersson, Hjalmarsson, and Avital (2013) take a similar functional approach distinguishing business models based on peer-to-peer trading of digital and tangible materials, sharing of goods, and sharing of services. They also examine the characteristics of sharing platforms based on the planning horizon for every transaction, assessing whether it is immediate (i.e., only a short time is required for planning every transaction), recurring (a long time is required for setting up the

first transaction), or deferred (a long time is required for planning every transaction). Similarly, Demary (2015) characterizes peer-to-peer platforms based on the cost of transactions (i.e., whether supplier, consumer, both supplier and consumer, or advertisers (in multisided platforms) pay the charges), while Choudary (2015) focuses on the architectural framework (using a categorization based on whether the platform focuses on community building, the provision of infrastructure, or data) and patterns of exchange in the platforms (based on whether platforms primarily exchange information, currency, and/or goods and services).

In this study, we adopt the sharing economy categorization of Gansky (2010) and Rauch and Schleicher (2015). These authors consider two business models in which a business either owns goods or services and rents them out or creates a platform for the exchange of goods and services on a temporary basis and makes a profit by charging fees to parties involved in a myriad of ways (as illustrated earlier by Demary, 2015). Gansky (2010) names these two sharing economy models the "full mesh mode" (company assets rented out to customers) and the "own-to-mesh mode" (platforms enabling peer-to-peer sharing of goods for a transaction or partnership fee rather than owning the goods). Rauch and Schleicher (2015) name these two business models "asset hubs" (the business owns the goods or services and rents them out) or "peer-to-peer sharing networks" (the business creates a peer-to-peer platform for the exchange of goods and services on a temporary basis).

Types of Crowdsourcing

Virtual Labor Markets (VLMs)

A VLM is an IT-mediated market where individuals can provide online services that can be performed anywhere (often by engaging in spot labor), offered by organizations generally through micro-tasks, typifying the production model of crowdsourcing (Brabham, 2008), in exchange for monetary compensation (Luz, Silva, & Novais, 2015; Prpić, Taeihagh, & Melton, 2014).

Micro-tasks offered at sites such as Amazon's Mechanical Turk (MTurk) and Crowdflower include document translation, transcription, photo and video tagging, editing, sentiment analysis, categorization, data entry, and content moderation (Crowdflower, 2016). These are activities that can be divided into various steps (micro-tasks) that can be completed in parallel and at scale using human computational power. Currently

these tasks can be better performed through collective intelligence rather than through artificial intelligence and automation. Furthermore, at the moment, most of the laborers working through VLM websites often work independently and anonymously and cannot form teams or groups using the VLM platforms. This is a function of the current design of these platforms and could (and probably will) change in the future to allow more sophisticated tasks to be performed. At the moment, most of these micro-tasks require low to medium levels of skill and are at times repetitive, meaning the compensation level per task is low.

Tournament Crowdsourcing (TC)

TC (Glaeser, Hillis, Kominers, & Luca, 2016; Zhang et al., 2015) is another form of crowdsourcing in which organizations post their problems to specialized IT-mediated platforms such as Eyeka or Kaggle or to in-house platforms such as Challenge.gov (Brabham, 2013). Here, with the help of the IT-mediated platform, organizers form a competition and set the rules and prize(s) for the competition. Individuals or groups can post their solutions through the specialized IT-mediated platform to be considered for a prize, which range from a few hundred dollars to hundreds of thousands of dollars or even more.[4]

These TC platforms generally attract and maintain more specialized crowds who are interested in the particular focus of the platform, which can differ widely from computer science (Lakhani, Garvin, & Lonstein, 2010) and data science (Taieb & Hyndman, 2014) to open government and innovation (The White House, 2010). Relative to VLMs, these TC platforms generally attract smaller numbers of more specialized individuals, and members can choose to not be anonymous at these sites so as to benefit from the reputational gains from their successful participations (Prpić et al., 2015).

Open Collaboration (OC)

In the OC model of crowdsourcing, problems or opportunities are posted by an organization to the public through IT systems and crowds voluntarily engage in these endeavors generally without expecting monetary compensation (Michel, Gil, & Hauder, 2015; Prpić et al., 2015). Examples of this type of crowdsourcing include starting an enterprise wiki or using social media and online communities to gain contributions (Budhathoki & Haythornthwaite, 2013; Crowley et al., 2014; Mergel, 2015).

The level of engagement from the crowd depends on a number of factors such the efficacy of the "open call" by the organization, the crowd capital of the organization as well as the reach and engagement of the IT platform used (Prpić & Shukla, 2013). As an example, as at May 2015, Twitter had more than 500 million users, out of which more than 310 million are active on a monthly basis.[5] However, this does not necessarily translate into significant engagement from the potential pool of users on the platform. An open call might get the attention of celebrities or Nobel Laureates and get significant traction and diffusion though their networks or, on the other hand, it might simply be ignored if the organization does not have ample influence within the network. Factors such as level of popularity and level of prior engagement on the platform by the organization, number of followers, number of retweets or mentions the organization garners, and popularity of the followers and their level of reach in turn, along with the content posted, are a small subset of the many factors that influence the level with which crowds might engage with the open call (Cha, Haddadi, Benevenuto, & Gummadi, 2010).

Comparison of Crowdsourcing with the Sharing Economy

As mentioned in the introduction of the article, although various forms of the sharing economy and crowdsourcing can share a large number of common characteristics, the literature in each domain at times ignores the other or treats it as a singular form. Additionally, in some instances a platform is categorized as both a sharing economy platform and a crowdsourcing platform by different scholars. For instance, scholars generally distinguish between Amazon MTurk and TaskRabbit given that the former provides a virtual service that can be performed online and the latter provides a physical service that needs to be performed locally (Aloisi, 2015; De Groen et al., 2016). This distinction is fundamental to the works of Gansky (2010) and Rauch and Schleicher (2015) as they solely focus on the exchange of physical goods or services that must be provided in person, which implicitly differentiates between the sharing economy and crowdsourcing as crowdsourcing can be performed virtually. However, there are numerous instances in the literature where both of these platforms have been categorized as part of the sharing economy. This issue is particularly prevalent when the topic under study relates to labor markets or commons (e.g., Amazon MTurk and Wikipedia). Nevertheless, Westerbeek (2016) explicitly differentiates between crowdsourcing and sharing economy platforms by pointing out the one-on-one peer-to-peer

aspect to be the most important part of the sharing economy that is *not* present in crowdsourcing.

As shown in second and third sections of this article, crowdsourcing and the sharing economy both encompass a wide range of activities and business models. Crowdsourcing refers to three generalized types of VLM, TC, and OC with varying levels of accessibility, crowd magnitude and scale as well as IT structure used (Prpić et al., 2015). Below we expand and enhance this characterization of crowdsourcing types to cover the sharing economy in the form of asset hubs and peer-to-peer sharing networks and further consider platform architecture and interactions (see Table 1). By carrying out this systematic examination we address a key gap in the literature and bring to light a more nuanced picture of the similarities and differences between the crowdsourcing and sharing economy types. A quick examination of Table 1 shows that each of the five types of IT-mediated platforms have their own unique set of characteristics while sharing commonalities with the other four types of crowdsourcing and sharing economy platforms.

Accessibility

IT-mediated crowds can be examined based on the level of openness of their platform. Prpić et al. (2015) distinguish between platforms based on whether the platform is open to the public free of charge or requires payment for gaining access (and thus is private). OC platforms and peer-to-peer sharing networks are considered public, while TC, VLMs, and asset hubs are considered private (see Table 1).

Accessing peer-to-peer sharing networks such as Uber can be as simple as downloading an app on a mobile phone and a quick sign up, and in OC crowdsourcing similarly the payment of fees is not required for accessing the service. Of course, the actual use of the service is an entirely different matter and often requires payments in peer-to-peer sharing networks—unlike OC crowdsourcing.[6]

In the case of TC and VLMs, individuals or organizations need to pay a launch fee to start a competition or access the spot labor (Prpić et al., 2015). In a similar fashion, most for-profit asset hubs require the payment of a fee to access the service offered.[7]

Table 1.
Comparison of different types of Sharing Economy and Crowdsourcing – partially based on (Prpic et al., 2015).

	Accessibility	Anonymity	Crowd magnitude	Nature of the crowd	Platform architecture	IT-structure	Platform interactions
Virtual labour markets (e.g. Amazon Mturk)	Private	High	Millions	General	Community building and infrastructure provision	Episodic	Information, currency, and virtual services
Tournament crowdsourcing (e.g. Kaggle)	Private	Medium	Hundreds of thousands	Specialized	Community building	Episodic	Information, currency, and virtual services
Open collaboration (e.g. Twitter)	Public	Variable	Hundreds of millions	General	Community building	Collaborative	Information
Asset hubs (e.g. Zipcar, Car2go)	Private	Low	Hundreds of thousands to a few millions	Specialized	Community building and infrastructure provision	Episodic	Information and currency
Peer-to-peer sharing networks (e.g. Uber)	Mostly Public	Low	Hundreds of thousands to millions	General or specialized	Community building, infrastructure provision and data layer	Collaborative	Information and currency, in some instances goods/ services as well.

Source: Author's own.

Anonymity and Reputation Systems

Anonymity in the context of crowdsourcing and the sharing economy refers to whether the participants in the crowds in different types of platforms are anonymous with respect to their offline identity. OC platforms have a variable level of anonymity because of the different contexts and natures of the activities of a particular site, as well as user preferences (Prpić et al., 2015). VLMs such as Amazon MTurk provide "methodological anonymity" by providing unique numeric identifiers to the requester as a means of connecting them with MTurk workers, which provides them with a high level of anonymity. TC platforms do not necessarily require the matching of offline and online identities, although strong incentives might exist for the crowds frequenting such sites to connect their offline and online identities to advance their offline career. Moreover, both crowdsourcing and sharing economy platforms use reputation systems to maintain and improve the participation of IT-mediated crowds. Morschheuser, Hamari, and Koivisto (2016) review the use of reputation systems in crowdsourcing by examining the literature on the use of points/scores, leaderboards/rankings, badges/achievements, levels, progression and reward systems, etc. Furthermore, new studies on the use of reputation systems in the sharing economy are emerging (Ert, Fleischer, & Magen, 2015; Slee, 2013; Zervas, Proserpio, & Byers, 2015).

Crowd Magnitude

Crowd magnitude refers to the number of available individuals to implement crowdsourcing or sharing economies by conducting activities such as performing a task or providing a service, which ultimately dictates the rate and scale with which resources can be created or provided in each platform (Prpić et al., 2015). Table 1 presents the magnitude of different crowds for each form of sharing economy and crowdsourcing reviewed.

Codagnone, Abadie, and Biagi (2016) provide a review of the numbers of registered contractors on various sharing economy platforms, demonstrating that the size of largest crowds in peer-to-peer sharing networks can reach into the millions. In the case of asset hubs, Car2go has over a million users and Zipcar has close to a million users (Avis, 2016; Dryden, 2015). Prpić et al. (2015) report on the largest size of crowds in crowdsourcing platforms, which range from thousands of participants to the hundreds of millions: OC platforms such as Twitter and Facebook have hundreds of millions of members, while TC platforms and VLMs'

magnitude of crowds also range from hundreds of thousands (Kaggle, eYeka) to millions (Crowdflower, Amazon MTurk).

Nature of the Crowd

In crowdsourcing and the sharing economy, specialized crowds form around specific types of content or service, while general crowds provide or perform a multitude of common tasks or services. The nature of the crowds can influence the size of the potential crowd available for a specific endeavor, as well as impacting the tasks assigned to the participants and the features of the IT used, for instance the various forms of TC, are unlikely to reach the same size as general OC platforms or some of the larger peer-to-peer sharing networks (Prpić et al., 2015).

Table 1 highlights that asset hubs and TC rely on specialized crowds, whereas OC crowdsourcing and VLMs rely on general crowds that either form around multiple kinds of content (OCs) or services (VLMs). Peer-to-peer sharing networks represent a more complex picture as their crowds can be specialized or general. For example, an individual or organization interested in an asset hub such as Zipcar is largely interested in a specific type of good or service offered whereas in peer-to-peer sharing networks individuals might be interested in specific services (such as in the case of Uber) or be more generalized (such as in the case of TaskRabbit).

Platform Architecture

Choudary (2015) examined a selection of IT platforms and categorized them based on their architectural frameworks and configuration and their patterns of exchange. He identified that all platforms function across three layers but the degree to which each layer is dominant varies:

1. Network-marketplace-community layer: comprises the individual members of the crowd and their network of interactions with other members. The network interaction might be direct with each other as in social networks or implicit in the case of markets in which buyers and sellers interact regularly. In some instance, this implicit community is formed when there are no direct interactions between the individual users but the platform leverages the data available from individual users and benchmarks them with one another to create value.
2. Infrastructure layer: enables value creation in the platform via the provision of tools, services, and rules. The infrastructure system in

itself does not create value but allows users to create value using this infrastructure, such as in the case of platforms such as YouTube that facilitates content creation, dissemination, and monetization.

3. Data layer: all platforms use data but the extent and intensity varies among them significantly. At a minimum, data are used for connecting the users of a platform with relevant goods/services/content. However, in some platforms data plays the leading role.

Table 1 highlights that OC, VLM, and TC platforms all focus on value creation by creating a network-marketplace-community layer. VLMs (more so than TC platforms) also focus on providing tools and services that facilitate the connection of individuals and organizations that demand work with crowds, as well as providing templates, tools and APIs that facilitate the creating of tasks and the receiving of results from the crowds. Asset hubs also strongly focus on the network-marketplace-community layer as well as infrastructure provision. Companies such as Zipcar and Car2go, for instance, operate based on developing and maintaining sizeable fee-paying crowds and providing and maintaining an infrastructure network of vehicles for their use. Peer-to-peer sharing networks arguably have the most sophisticated architecture and rely on a mixture of network-marketplace-community, infrastructure, and data layers that vary in terms of the functionality they provide. Asset hubs also utilize data layers but given that asset hubs have more control over their own companies' assets relative to peer-to-peer sharing networks, which rely solely on users' goods/services, it can be argued that data layers are far more vital for the proper functioning of peer-to-peer networks. For instance, an asset hub such as Zipcar can relocate their own vehicles to different locations for the provision of service, whereas a company such as Uber has to utilize more sophisticated analytics to change the behavior of their contracting drivers and provide coverage in different areas.

Platforms' IT Structure

Prpić and Shukla (2013) distinguish between two types of IT structure, namely collaborative IT structures and episodic IT structures, based on whether crowd members interact with each other through the IT platform for the purpose of deriving resources from the crowd. We can extend this concept to the sharing economy by examining whether IT-mediated crowds in the sharing economy need to interact with one another directly through the platform for the purpose of accessing goods or services (collaborative IT structures) or whether crowd members never need to

directly interact with each other through the IT platform (episodic IT structures).

Prpić et al. (2015) highlight that VLMs use episodic IT structures (e.g., Amazon MTurk micro-tasks are carried out by individual crowd participants without interactions with each other, at least at the moment) and OC crowdsourcing platforms are found to generally use collaborative IT structures (e.g., social networks such as Twitter inherently exhibit collaborative IT structures due to extensive crowd interactions and over time), while TC platforms can allow both forms (e.g., an individual in a platform like kaggle can work separately from the others or can use the reputation system and results from previous competitions in the platform, connect with others and form teams for participating in the completion in the hope of increasing their chance of winning the tournament).

Similarly, in asset hubs, there is no need for the crowd members to connect with one another. For instance, crowd members using car-sharing services such as Zipcar or Car2go do not interact with one another and the central platform run by the asset holding company manages various coordination and scheduling efforts. Needless to say, the situation is completely different for peer-to-peer sharing networks as they directly rely on peer engagement and the collaborative aspect that the IT structure provides to function properly.

Table 1 illustrates that peer-to-peer sharing networks and OC crowdsourcing share similar collaborative IT structures while asset hubs along with VLMs and TC share similar episodic IT structures (not necessitating direct interaction of participants through the platform). As such, platforms that rely on collaborative IT structures require the existence, generation, and maintenance of social capital to function properly (Prpić & Shukla, 2013).

Platform Interactions

The dominant social and economic interactions in platforms revolve around the exchange of information, good/services, or currency (Choudary, 2015). All of the platforms highlighted in Table 1 share one fundamental aspect in that they all facilitate the exchange of information. VLMs, TC, and asset hubs facilitate the exchange of information and currency in various forms. Furthermore, in VLMs and TC virtual services are also exchanged through the platform. Initially, the transfer of information from the individuals or organizations demanding work or expertise to workers and tournament participants is carried out. This is

followed by the exchange of information and flow of virtual services in the form of the performance of tasks and provision of results and solutions.[8] Finally, a currency exchange is carried out for the compensation of the crowd for their services. OC platforms are voluntary and often do not involve the exchange of currency or goods or services and thus the main form of exchange through such platforms is free information and/or content.[9]

Asset hubs and peer-to-peer sharing networks both involve the sharing of information and currency, generally through procedures such as: transfer of information on goods/services from provider (business or individual) to consumer, followed by the transfer of money from consumer to provider and subsequently the transfer of goods/services from the provider to the consumer. It is obvious that, unlike as is the case with virtual goods/services, in the case of physical assets the exchange of goods/services is not possible through the platform itself, although in some instances peer-to-peer sharing networks do also track, facilitate, and monitor the exchange of goods/services internally. Choudary (2015) highlights that a peer-to-peer sharing network such as Uber can track the "transportation-as-a-service" exchange as it is aware of the path of the trip using GPS and mobile networks, which helps in terms of fee calculation and the determination of the completion of the ride.

Crowdsourcing, the Sharing Economy, and Development

The aim of the previous section was to bring attention to the nuanced similarities and differences between crowdsourcing and sharing economy platforms which can be used by developing countries when attempting to leverage these IT-mediated technologies for development. The comparison revealed that the five types of IT-mediated technologies examined (Asset Hubs and Peer-to-peer networks, VLMs, TC, and OC) do not replicate each other and have unique attributes, while sharing commonalities with other forms. Understanding that developing countries have different development priorities helps in better capturing the challenges they face in the adoption of new technologies (Koch, 2015). One such approach that offers a more nuanced understanding of developing countries and their characteristics by taking into account countries' needs as well as resources and institutional capacities is the multi-dimensional clustering system of different types of developing countries. It categorizes developing countries into five groups based on factors such as levels of poverty and inequality, productivity and innovation, political constraints, and

dependence on external flows (Vázquez & Sumner, 2012, 2013, 2015). In this work, each cluster of countries has a specific developmental character and set of issues that cannot be reduced to a simple representation using a single metric. In Table 2, we have developed a summary of the work by Vázquez and Sumner.

As with the introduction of any new technology, the proponents of crowdsourcing and the sharing economy focus on the positive aspects, such as the ease with which individuals can connect, interact, and exchange information, currency and goods and services, and promise positive societal transformation. While often the initial focus of scholars with the introduction of new technologies is on developed countries, developing countries can benefit from them as well. For instance, it is argued that sharing economy platforms, particularly peer-to-peer sharing networks, can boost small-scale service sectors in developing countries, as through the use of IT platforms they can reduce overhead costs and require relatively smaller levels of capital investment, solving informational problems by quickly matching consumers with suppliers (Ozimek, 2014) and in fact recent survey data from Hira (2017) suggests an exponential increase in founding of sharing economy and crowdsourcing start-ups in developing countries.

While some scholars see the sharing economy and crowdsourcing as a potential pathway toward sustainability that can give voice to consumers and increase social capital, income, and reciprocity, others warn of the potential for grave scenarios in which these platforms erode accountability and tax bases, divide communities, discriminate against individuals, underpay individuals, destroy job security, and result in the domination of markets by multinational corporations in the name of neoliberal capitalism (Dillahunt & Malone, 2015; Edelman & Luca, 2014; Heinrichs, 2013; Hira & Reilly, 2017; Martin, 2016; Reeves, 2015; Stone, 2012). Similarly, Zvolska (2015) points out that while at the moment emphasis is generally placed on the potential sustainability of the sharing economy, concrete research substantiating these claims is scarce.

It must be pointed out that the success of development and the diffusion and use of innovative technologies depends on social, political, and institutional factors (Edquist, 2005; Schor, 2014). As was illustrated in the previous section, relative to their developed counterparts developing countries often fall behind in terms of GDP, levels of productivity, innovation, governance, and political freedoms and have higher rates of poverty, income equality, and dependence on external flows of cash.

Table 2.
Characteristics of Different types of Developing Countries – Developed based on Vázquez & Sumner Research on Groupings of Developing Countries (2012; 2013; 2015)

	Poverty	Income inequality	Productivity	Innovation	GDP	Political Freedom	Governance	CO2 Emissions	External Flow
Type C1 **High poverty rate countries with largely traditional economies** **E.g. (2005–2010):** Sierra Leone; Ethiopia; Rwanda; Haiti; Bangladesh; Pakistan; India[1];	Highest	Moderate	Lowest	Lowest	Lowest	Very Low	Poor	Low	High
Type C2 **Natural resource dependent countries with little political freedom. E.g. (2005–2010):** Vietnam; Tajikistan; Yemen; Cameroon Angola; Chad; Congo;	High	Low	Low	Low	Low	Low -	Poor	Low	Moderate
Type C3 **External flow dependent countries with high inequality** **E.g. (2005–2010)**: Bolivia; Indonesia Thailand; Peru; Colombia; Ukraine; Sri Lanka; Kenya	Moderate	High	Moderate	Moderate	Moderate	High	High	Moderate	High
Type C4 **Economically egalitarian emerging economies with serious challenges of environmental sustainability and limited political freedoms** **E.g. (2005–2010):** Iraq; Egypt; China; Jordan; Azerbaijan; Venezuela	Moderate/ Low	Lowest	High	High	High	Lowest	Poor	High	Low

(Table 2 continued)

(Table 2 continued)

	Poverty	Income inequality	Productivity	Innovation	GDP	Political Freedom	Governance	CO2 Emissions	External Flow
Type C5	Lowest	High	Highest	Highest	Highest	Highest	Highest	Highest	Lowest
Unequal emerging economies with low dependence on external finance, E.g. (2005–2010): Turkey; Brazil; Mexico; Argentina; South Africa; Malaysia									

Source: Author's own.

Note: Vázquez & Sumner (2013) point out that even with this more nuanced categorization of the developing countries, it is not possible to perfectly match the group assignments of the countries. They point out that while Type C1 contains the most similar group of countries, the case of India is atypical (Gini coefficient considerably lower than the group average. GDP 16% higher in non-agricultural sectors relative to the group average. Lower exports of primary products, five times higher scientific article production and four times lower dependence on external finance relative to the group average as well as better governance and democracy indicators).

Given the nuanced differences within each country group, a one-size-fits-all approach to the adoption of crowdsourcing and the sharing economy in developing countries is not feasible. Below we focus on some of the relevant challenges facing different types of developing countries, with a particular focus on the governance and regulatory aspects.

Arguably the most important requirement for setting up and successfully operating crowdsourcing and sharing economy platforms in the first instance is access to communication networks for activities such as the exchange of information, currency and transactions among crowds (e.g., consumers with suppliers or workers with tasks from employers). According to Vázquez and Sumner's (2015) classification, which was elaborated in the previous section and in Table 2, Type C1 and C2 countries with the worst development indicators (i.e., higher levels of poverty and lower levels of labor productivity and innovation capacity) are dealing with severe poverty problems and have more difficulty in implementing such technologies to begin with. World Bank indicators on the diffusion of mobile phones by country groupings, mobile cellular subscriptions per 100 people, and individuals and households with access to internet suggest this is indeed the case (World Bank, 2015, 2016).[10] Furthermore, Type C1 and C2 countries have higher levels of contribution from the agricultural sectors and larger portions of the population that have difficulty in using online platforms for carrying out more sophisticated tasks online such as participating in VLMs and TC that require higher capacity and access to computers rather than mobile phones that facilitate local (mobile) sharing economy activities (relative to their counterparts in C3 to C5 groupings, which have higher levels of urban population).

Research suggests that developed countries disproportionally hire more individuals from crowdsourcing and sharing economy platforms than developing countries to conduct online and local tasks (Codagnone et al., 2016). Aside from issues relating to discrimination between individuals (discussed in the next subsection), here again the transfer of higher skilled and higher paying jobs within developing countries is not equal. Type C4 and C5 countries that generally have higher levels of productivity and innovation are more likely to get the better paying jobs such as programming and engage in specialized forms of IT-mediated technology such as TC. On the other hand, C1 to C3 countries will attract low- to medium-skilled work. Even in this case, Type C1 and to some extent C2 countries are at a disadvantage as it is more likely that individuals in these countries might not have the ability to provide verifiable personal information or demonstrate the lack of a criminal record (Nguyen, 2014)

as part of joining a platform that might bar them from participating in online platforms as well as having more difficulty in transferring funds online. Therefore, it can be argued that, although a certain level of outsourcing from developed countries to developing countries is happening, the economies that have moved away from traditional agriculture and are more advanced will benefit more, which could in fact further increase the gap between C4 and C5 countries and their C1 to C3 counterparts that have more traditional economies.

Governance

Public governance is the process by which a society manages itself and organizes its affairs and is a bedrock for successful and stable economies (UN, 2007). Developing countries often suffer from inefficiency in terms of the delivery of vital public services, inefficient revenue systems, poor transparency, and the inappropriate allocation of resources, which often manifest themselves in acute problems in sectors such as healthcare (Asante, Zwi, & Ho, 2006; Berglof & Claessens, 2006; Shah, 2005).

According to Ozimek (2014), poor governance and a lack of effective regulatory regimes in developing countries combined with weak property rights make attracting the investment required for building large companies with high reputational capital difficult. He argues that in the absence of good governance practices, nimble decentralized crowd-based rating systems lower the bar for the existence of an effective services industry and bypass the need for regulation, as users in these countries will trust peer-based feedback systems that can inform them about quality of goods/services more that government endorsed companies and will help them in avoiding fraud and wrongdoing. However, Aloisi (2015) believes these ranking systems and approval ratings transfer the traditional role of management to the users of the platforms, highlighting that with this transfer the recipients of such reviews in the platforms are less protected from external manipulation and agendas. Furthermore, given that most of crowdsourcing and sharing economy companies are commercial and seek profits (with the exception of some OC crowdsourcing platforms and non-commercial peer-to-peer sharing networks) Ozimek's views about potential of IT platforms seem rather optimistic.

Codagnone et al. (2016) have already documented instances of litigation in the USA in regard to crowdsourcing and the sharing economy concerning employee benefits, cost reimbursements, violation of labor standards, incorrect classification as contractors, and minimum wage

and overtime payments. Uncontrolled price wars between firms can also affect workers, employees, and contractors. Stiff competition can result in price reductions by firms seeking to attract more consumers and an increasing volume of business but this can also result in contracting drivers being undermined, affecting the industry and ultimately consumers as a whole (*Straits Times*, 2016). If such issues are surfacing so quickly with the adoption of crowdsourcing and sharing economy practices in developed countries such as the USA and Singapore, which have strong governance and regulatory regimes, as well as effective enforcement mechanisms relative to developing countries, the counter argument that given the governance and regulatory deficits in developing countries a stronger and stricter enforcement and oversight of these platforms is needed also seems plausible.

In developed countries, in response to some of these legal challenges, firms such as TaskRabbit, Uber, and Lyft have made adjustments to their business models. However, without adequate regulation being in place, Type C1, C2, and C4 countries are susceptible to firms entering their markets and dominating them while passing on the risks to workers, contractors, and consumers (e.g., not having strict regulations for mandating third-party insurance in ride-sharing platforms or protecting privacy and financial information in both commercial crowdsourcing and sharing economy platforms that carry out currency exchanges) and then dealing with any litigation afterwards, perhaps after a long period in which they took advantage of the situation. This is further exacerbated because these countries (particularly C1 and C2 types) are less capable of monitoring the activities of the platforms and ensuring the correct collection of records and sufficient tax payments to the state.

Codagnone et al. (2016) and Aloisi (2015) focus on the work-related challenges surrounding IT-mediated platforms, examine the relevant literature, and meticulously unpack issues such as workplace health and safety, discrimination, and social arbitrage to address exploitation using these platforms and facilitate employment online (e.g., Amazon MTurk) or locally (e.g., TaskRabbit). Accordingly, they suggest:

- the development of a minimum wage and maximum working hours per day restrictions;
- avoiding exclusivity clauses that tie workers to a particular platform;
- the inclusion of relevant forms of social protection and health insurance;
- the provision of liability insurance for damage to third parties;

- privacy protection mechanisms for workers;
- guarantees for avoiding algorithmic discrimination with respect to geographical preferences, gender, ethnicity, race, or age when matching individuals in platforms; and
- mandating the portability of an individual's performance across platforms

Many of the suggested remedies are challenging to implement and are yet to be addressed in developed countries, which further increases concerns in regard to developing countries. All of the developing countries can benefit from improving their governance and regulatory capacity and capability relative to developed countries. This in turn will facilitate addressing the aforementioned issues. As highlighted in Table 2, Type C1, C2, and C4 countries have the highest levels of governance deficit, which demonstrates the challenges in addressing the issues raised by Codagnone et al. (2016) and Aloisi (2015). Moreover, it is worth pointing out that the compounding effects of corruption and restrictions on political freedom in these countries further exacerbate these problems, as such workers in these countries will be more vulnerable relative to their Type C3 and C5 counterparts.

Highly publicized concerns about Uber, for instance, due to excessive charges from the surge-pricing algorithm and drivers being accused of assault, resulted in blanket bans in some cities, as unlike the traditional taxi industry Uber was initially not subject to strict regulations for pricing and licensing (Gobble, 2015). However, the findings of the study by van den Broek (2015) suggest that, although firms such as Airbnb and Uber try to hold on to their generic business models as much as possible, in the face of regulatory constrains (mainly relating to drivers in the case of Uber and hosts in the case of Airbnb) these firms have adapted their business models and have found ways to operate legally within the set framework.

As such, the active participation of governments in developing countries and more effective regulation of the affected sectors is paramount for gaining the benefits of IT-mediated platforms highlighted earlier (e.g., even addressing shortcomings in provision of goods/services by the state as suggested by Ozimek [2014]) and avoiding negative consequences such as labor law violations, discrimination, infringements on privacy, etc. Type C3 and C5 countries, with higher governance capacities, are more likely to be able to work with firms, or impose restrictions on them to encourage the adoption of positive practices. Additionally, given the higher level of productivity in Type C4 and C5 countries, they

can utilize pull mechanisms to direct innovation in IT-mediated technology and provide funding and support to companies that follow best practices. Research by Sadoi (2008) suggests that focusing on developing local technological capabilities within a country is more successful than the provision of incentives to firms for technology transfer to developing countries as successful transitions depend on countries developing their own innovation hubs. As such, Type C1 to C3 countries should not just open markets to external corporations but should exert some control and focus on improving levels of productivity and innovation and perhaps given the complexity of the issues at hand and the severity of constrains they face set stricter control mechanisms relative to their C4 and C5 counterparts, or even focus on direct provision of services.

It is worth mentioning that some forms of crowdsourcing platform, particularly OC crowdsourcing, rather than receiving support, might be strictly limited in some of the developing countries with lower levels of political freedom (Type C4, C1 and C2) or actively used for reducing political freedom, as new empirical research by Asmolov (2015) demonstrates that, using volunteers from crowdsourcing platforms, it is possible to prevent collective action.

Conclusion

This article examined the sharing economy and crowdsourcing and highlighted various types of each IT-mediated technology. Afterwards, given the similarities of crowdsourcing and sharing economy in terms of their use of IT, reliance on crowds, monetary exchange, use of reputation systems, and the gap in the literature in regard to their nuanced similarities and differences, the sharing economy and crowdsourcing were systematically compared along several dimensions.

We advanced the literature on the sharing economy and crowdsourcing by providing a comparison of their types across dimensions such as accessibility, crowd magnitude, nature of the crowd, anonymity, platforms' architectural frameworks, IT structure, and interactions. This systematic comparison brought a more nuanced understanding of these IT-mediated technologies and highlighted similarities and differences between various types of crowdsourcing and sharing economy platforms, demonstrating that each type of IT-mediated technology examined had unique attributes, while sharing commonalities with other forms. It addressed a gap in the current literature where these IT-mediated technologies were either ignored in the other domain or treated as a singular form or even

at times categorized as both a sharing economy platform and a crowdsourcing platform by different scholars. Of course, examinations across these dimensions each include exceptions and the comparison should not be considered definitive. Nevertheless, it allows future researchers to better differentiate between the crowdsourcing and sharing economy. For instance, following Gansky (2010) and Rauch and Schleicher (2015), we mainly focused on the commercial use of the sharing economy that focuses on the exchange of physical goods or services that are carried out locally. This can be expanded in the future once research in the field goes beyond the types of categorizations highlighted in the current article and coalesces around a more detailed categorization of sharing economy types. This endeavor is currently under development, particularly in regard to peer-to-peer networks.

In addition to the above contributions, we examined the use of crowdsourcing and the sharing economy in developing countries. We went beyond the simple categorization of developing economies based on GDP and examined some of the challenges facing different groups of developing countries in addressing crowdsourcing and the sharing economy. We suggested which forms would be more appropriate when faced with different types of development issues, with particular focus on issues relating to mobile and online activities, productivity and innovation as well as legal and governance challenges, helping to highlight the differences in the applicability of these IT-mediated technologies in specific contexts.

We hope that this research facilitates a more nuanced examination of the applicability of these technologies in different types of developing countries, encourages researchers to study them more rigorously in future and helps industry and policymakers to work together more effectively to leverage the new potential of applying crowdsourcing and sharing economy for addressing developmental challenges while maximizing positive impacts and minimizing negative side effects.

NOTES

1. Demary (2015) based on Dahlman (1979) elaborates that platforms enable transaction costs to be reduced by facilitating: (a) the finding of information and reduction of search costs; (b) the checking of prices and decision making as well as bargaining on price; and (c) a reduction in the policing and enforcement costs by enabling payments via the platform.
2. For a recent survey of adoption of sharing economy in developing countries, see Hira (2017).

3. Westerbeek (2016) defines peer-to-peer sharing as when the main objective of the business transaction can be reached using a one-on-one one-off transaction between a provider and a user (e.g., in an Uber ride a certain location is reached after a one-to-one transaction [the Uber ride]).
4. https://www.kaggle.com/competitions
5. https://about.twitter.com/company
6. A variety of payment systems are used for transactions in peer-to-peer networks that range from payments from suppliers, consumers, or both to payment by advertisers in multisided platforms (Demary, 2015).
7. For instance, in the case of car-sharing companies Car2Go has a $35 registration fee (plus tax) and Zipcar has a $25 one-time application fee (Car2Go, 2016; Zipcar, 2016). Both of these services offer plans catering to the needs of their members ranging from pay-as-you-go plans to monthly plans that offer certain prepaid miles that a member can use.
8. As described earlier, the distinction between virtual and physical services here is important. In VLMs and crowdsourcing, as the service can be performed online the flow of the service is virtual, whereas in the sharing economy platforms that entail the provision of physical services (e.g., TaskRabbit) the flow of service is not captured through the platform, meaning such platforms only allow the exchange of information and currency.
9. It must be pointed out that solely the exchange of information is predominant in OC crowdsourcing platforms. In the sharing economy, it is possible that platforms solely facilitate the exchange of information, and exchange of goods/services and currency is carried out outside the platform (such as in the case of platforms that rely on advertisement and listing fees).
10. The most important difference between C1 and C2 countries according to Vázquez and Sumner (2013) is in terms of level of primary exports (much higher in C2), quality of democracy (higher in C1), and dependency on external finance (higher in C1).

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