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► **To cite this version:**

Valentina Carbone, Aurélien Rouquet, Christine Roussat. The Rise of Crowd Logistics: A New Way to Co-Create Logistics Value. *Journal of Business Logistics*, 2017, 38 (4), pp.238-252. 10.1111/jbl.12164 . hal-03118967

HAL Id: hal-03118967

<https://uca.hal.science/hal-03118967>

Submitted on 22 Jan 2021

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The rise of crowd-logistics: a new way to co-create value

Cite as: Carbone, V., Rouquet A., Roussat C. (2017) The rise of crowd-logistics: a new way to co-create logistics value? Journal of Business Logistics, 38(4), 238-252

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Introduction

One of the numerous outcomes of the digital revolution on our "old" economy is the recent rise of "crowdsourcing" initiatives: GoFundMe, Wikipedia, etc. Activities that were once handled by a firm and its designated agents such as employees can now be entrusted to the multitude of ordinary people, the "crowd" of individuals (Howe, 2006). Management research has hitherto focused on two types of crowd practices: first, crowd funding (Ordanini et al., 2011; Belleflamme et al., 2014), which aims to tap into the financial resources of the crowd in order to finance projects; and second, crowd innovation (Collm and Schedler, 2012; Boudreau and Lakhani, 2013), which aims to tap into the intellectual resources of the crowd for the purpose of innovation.

In addition to financial and intellectual resources, the crowd also possesses logistics resources: strong arms to move furniture, physical assets such as garages to store merchandise, vehicles to transport goods, etc. Often left idle and underutilized, these resources may be activated when needed to provide logistics services. This opportunity is currently being exploited by a host of start-ups that are appearing all over the planet. In the US, for example, Deliv enlists private individuals to provide faster and cheaper delivery services to customers of retail stores. In the UK, Storenextdoor seeks to make use of the unoccupied garages and basements of individuals by renting them out, thus providing local storage options at a low price. Newcomers are attracted by this business potential. After taking on the taxi industry, Uber is now entering logistics markets to offer new services: UberEats for food deliveries and UberRush offering same-day delivery to online shoppers (in New York, San Francisco and Chicago).

Bearing in mind the dearth of research on this topic, our purpose is to develop an initial conceptual approach to these initiatives, that we term "crowd logistics", meant as "initiatives that tap into the logistical resources of the crowd to perform logistics services". This article is structured in six sections. The first section reviews the (scarce) literature that relates to crowd logistics. The second section presents our methodology, which is based on the study of 57 cases of emergent crowd logistics initiatives. The third section highlights the main differences between crowd logistics and traditional business logistics. The fourth section introduces a typology of the different crowd logistics initiatives, based on the logistics services offered (storage, local delivery, freight shipping or freight forwarding). The fifth section shows how our results contribute to enriching the service-dominant logic perspective in the logistics field (Lusch et al., 2014) and introduces six theoretical propositions on the future development of crowd-logistics. The sixth section discusses the potential impacts of crowd-logistics on traditional businesses and argues that crowd local delivery is likely to have the strongest impact in the future. Finally, the conclusion identifies the limitations of our article and opens several avenues for future research.

1. Crowd logistics: an underexplored crowd practice

Crowdsourcing, a neologism formed from the words "crowd" and "outsourcing", was initially popularized by Howe (2006). It refers to the outsourcing by a firm of some activities to the crowd. The phenomenon encompasses "a highly varied group of approaches that share one obvious attribute in common: they all depend on some contributors from the crowd. But the nature of those contributions can differ tremendously" (Howe, 2008, p. 280). The rise of crowd practices rests on the idea that

individuals possess resources (financial, intellectual, material, etc.) that can be activated in order to perform traditional business activities through IT platforms (websites and mobile apps). In particular, extant research emphasizes two major resources of the crowd that can be activated: financial resources, which can be the basis for crowd-funding practices (Ordanini et al., 2011; Belleflamme et al., 2014), mainly developed in the cultural domain (Mollick, 2014) and intellectual resources, which can be the basis for crowd-innovation services (Collm and Schedler, 2012; Boudreau and Lakhani, 2013), such as the creation of a new advertisement (Berthon et al., 2008) or a new product (Djelassi and Decoopman, 2013).

Although a “crowdsourcer” was initially defined as a firm that outsources a task to the crowd (Schenk and Guittard, 2011; Schulze and Schader, 2011), in recent definitions (Estelle Arojas et al., 2012), the crowdsourcer may also be an individual asking the crowd to voluntarily undertake a task, thus coming very close to the “peer-to-peer for-profit” model (Schor, 2014, p.4) of the sharing economy. The sharing economy encompasses new forms of distributed production/consumption with the help of new technology and brings people together in new ways (Avelino et al., 2015), with individuals taking on the roles of provider/producer. The sharing economy can be broadly divided into four categories (Schor, 2014): recirculation of goods (or secondary markets), increased utilization of assets (rental processes for example), exchange of services (like time banking), and sharing of productive assets (like cooperatives). It embraces different approaches, practices and conceptualizations promoting the role of individuals. Crowd practices contribute to the contemporary transition towards the sharing economy. The concepts of crowdsourcing and sharing economy are still evolving (Schenk and Guittard, 2011) and their definitions vary and overlap (Schor, 2014). These new streams are currently at the center of attention for both experts (e.g., Botsman and Rodgers, 2011; Gansky, 2010) and researchers in consumer research and economics (e.g., Belk, 2010 and 2014; Sundararajan, 2016).

Despite these recent trends, crowd logistics has not been the subject of many research papers. Only a handful of papers mention the phenomenon: Chen et al. (2014, p. 33), working on algorithms for mobile crowdsourcing problems, mention the potential emergence of an “urban crowd logistics paradigm where a participative pool of urban crowd-workers are co-opted to perform a variety of last-mile tasks.” Exploring different aspects of location-based systems, Mladenow et al. (2015, p. 1) observe that “in logistics, services may engage the crowd and leverage the concepts of crowdsourcing in several ways.” Finally, Mehmman et al. (2015, p. 134), examining several German cases, define crowd logistics as “the outsourcing of logistics services to a mass of actors, whereby the coordination is supported by a technical infrastructure” and point out that research in this area is still in its infancy.

In contrast to the paucity of academic contributions, crowd logistics has been actively discussed in the business world. Bubner et al. (2014) have used the term in *DHL-Trend Radar* and confirmed in the recent edition (Bubner et al., 2016) that the development of crowd logistics may have a major impact on the logistics industry in less than five years. The founder of BringBee, Stella Schieffer, uses the term in her blog, defining it as “logistics where private people or semi-professionals (i.e., [handymen who are] on the move all day) become part of the delivery chain and do deliveries.” Other experts (Botsman, 2014a) use the term “crowd-shipping” meaning “using the crowd to transform delivery”,

emphasizing one logistics activity (shipping) to the detriment of others. In this paper we use the broader term, "crowd logistics", a term modeled on crowdsourcing, like similar derivatives: crowd funding, crowd testing, etc. Crowd logistics thus refers to the provision of any logistics service, which can be defined as "the interrelated package of activities provided by a supplier that creates utility of time and place and insures form utility" (Perreault, 1973, cited by Emerson and Grimm, 1978, p.17) and can include traditional activities such as transporting and warehousing (Krauth et al., 2007) that draw on the logistics resources of the crowd.

2. Methodology

The purpose of this research is to develop a first conceptual approach to crowd logistics initiatives. Specifically, the objective of the paper is to address the following research question: "How can crowd logistics initiatives be defined and characterized?" Ketokivi and Choi (2014, p.134) argue that when "the research context is novel and unfamiliar", explanations (theory) can be derived from exploration and analysis. Following their recommendation, we do not seek to base our study on any pre-existing theoretical foundation, which might introduce an unwarranted theoretical bias into the analysis of what constitutes virgin territory. Instead, we have developed an inductive and exploratory research design which is more suitable to this topic, especially as the phenomenon of crowd logistics is emergent.

Given the nature of this emerging research topic, we decided to use a case study approach. As Yin (2014, p. 16) points out, a case study "investigates a contemporary phenomenon in depth and within its real-world context". Exploratory case studies are used in areas where there are limited empirical data and/or theoretical frameworks; they help to develop new issues and are considered as a good method to uncover areas for research and theory development (Voss et al., 2002). Following Yin (2014), a multi-case holistic design was chosen. Due to the incipient nature of crowd logistics initiatives, the research could not rely on a single case analysis to capture and conceptualize this new form of logistics. Multiple cases also allow an "appropriate level of abstraction" and "broader exploration of research questions" (Eisenhardt and Graebner, 2007, p. 27). Moreover, the "evidence from multiple cases is often considered as more compelling" (Yin, 2014, p.57).

The unit of analysis for this research is the crowd logistics initiative. Identifying a sample of initiatives to explore is not easy: some crowd-logistics initiatives are still experimental, others have failed, and new ones emerge every day. Following Schor (2014), we adopted a pragmatic approach to the selection of initiatives to examine. It relies on classification systems formulated by experts and on declarations made by self-described crowd logistics entrepreneurs. Using Botsman's "collaborative logistics snapshot" (2014b) together with case-by-case identifications, we identified 63 crowd logistics initiatives (crowd-logistics firms) materialized in IT platforms (websites and/or mobile applications). Our initial exploration revealed whether those initiatives — viewed externally or self-described as crowd logistics — actually rely on the crowd to provide the logistics service and could therefore be considered relevant for our research. Of the 63 initiatives, four (Cargomatic, Ghostruck, Sendle and Shyp) were (or had evolved into) business marketplaces that do not work with the crowd. One (Sparehitch) has been recently converted into a tourist information website and one website (Naldo) is written entirely in Korean, so we were not able to explore it.

Our final sample contains 57 initiatives. A large majority of these 57 initiatives originated in the United States or in Europe. However, as Schor (2014, p.1) notes, crowd practices have become “a global phenomenon” with initiatives flourishing in Latin America (PickApp, Canabanamala), Asia (Parcelio, Gogovan), Australia (Meemeep, Muber, Supptime) and in the Arab world (Jwebi, Zaagel). With the exception of MonsieurParking, Colivoiturage (2008) and Supptime (1985), which converted from traditional courier businesses, all the initiatives were created after 2010. While the financial results of the initiatives are difficult to estimate (from websites or the press), the data collection reveals the infancy of this business activity and its on-going development. For instance, a dozen platforms have closed, five of them are in beta version, nine show a low level of transactions and four were absorbed by other players during our exploration period. However, a certain number of crowd logistics initiatives have raised huge amounts of private funds and have already achieved a large market value. Instacart for instance had a \$2 billion valuation by investors as of April 2015 [New York Times, April, 30, 2015]. As for Postmates, the initiative “relies on 25000 couriers to make 1.3 million deliveries a month in 40 cities” [Time, July 11, 2016], “raised about \$140m from investors and was valued at \$410m” [FT.com, February 24, 2016]. Table 1 provides the list of the 57 crowd-logistics initiatives studied.

[Insert Table 1. Here]

Table 1. List of the 57 crowd logistics initiatives studied

Internet platforms constitute the core of such initiatives. Crowdsourcing relies by definition on an open call to the crowd that is transmitted today “mostly via internet platforms” (Schenk and Guittard, 2011, p. 3). To capture the holistic, global nature of this recent phenomenon, we decided to collect data on crowd logistics initiatives by studying their websites and mobile applications. Due to the emerging nature of the phenomenon we seek to explore, it is more difficult to gather useful, relevant information through face-to-face interviews. On the contrary, websites offer easy access to secondary data that “exist prior to the formulation of the research objectives at hand” (Rabinovich and Cheon, 2011, p. 303). Website-based research produces results that can be considered reliable as the data on which the empirical analysis is based has not been subject to researcher bias (Lewis, 1998). It offers unique advantages such as a greater internal validity and ease of replication when data is publicly available (Rabinovich and Cheon, 2011). Using websites as our main data gathering source is all the more appropriate given the dominance of the digital dimension in this phenomenon: bloggers and experts fervently discuss mobile apps and high-tech start-ups in this field. The traditional press has thus been replaced by websites as a reliable secondary source for this type of research. This data collection strategy allows us to answer the recent call of Calantone and Vickery (2010), who have urged SCM and logistics researchers to use more archival and secondary data.

The initial exploration was conducted between February and April 2015 and it was updated between November 2015 and October 2016. The initiatives we identified call on the crowd to provide logistics services, which may involve goods transportation and/or storage. To ensure the reliability of the research, each website was independently reviewed by two of the authors. Following recommendations from Netnography — a research method combining ethnography and the study of internet-mediated

communications (Kozinets, 2002) — we sought to contextualize the online data observed on the initiatives' websites using other available information such as videos, blogs and independent press articles. Thus, the exploration of the crowd initiatives' websites entailed several tasks: reading each page of the site (presentation of the service, FAQ, general conditions, registration forms, peer ratings and comments, etc.), viewing videos, studying related blogs or Facebook pages, exploring press rooms and so on. At the same time, we gathered information about crowd logistics initiatives (new launches, start-ups fundraising campaigns, new developments, geographical expansions, etc.) through twitter alerts and other media (radio or web interviews, newspapers). The research team also held several meetings during the data analysis period to discuss and resolve any differences in interpretation as we went along.

To explore the 57 crowd logistics initiatives, we performed a content analysis of the collected data using an inductive coding process. Content analysis is ideal for this type of research as it is "suitable for analyzing various qualitative and unstructured data" (Seuring and Gold, 2012) and can be used for the exploration of websites (Ellinger et al., 2003). Various categories were used to explore the crowd logistics initiatives. They were derived from the available material for each website (texts, graphics, photos, videos, etc.) and were built iteratively, constantly comparing categories and data (Seuring and Gold, 2012). The 16 categories that emerged in the first round were refined during the second iteration. They describe the initiatives in terms of their key figures, the actors involved and their logistics roles, the flows managed, the logistics service performed and the resources activated. This stage produced a general data table for the 57 initiatives (available upon request).

Inductive coding uses detailed readings of data to derive concepts, themes, or a model through interpretations (Thomas, 2006). In our particular case, interpreting the data from the general table led to two sets of results. First, it helped to define the emerging concept of crowd logistics. In particular, we compared the main characteristics of this new form of logistics with traditional business logistics. Second, the table helped to classify the different types of crowd logistics initiatives. Focusing on the type of service provided by the initiatives (i.e., the definition of their business activity), we were able to identify four types of crowd logistics and to specify their characteristics. Starting from the 16 descriptive categories in the general table, we ruled out some categories (website address, date of analysis, identification and names of actors) and combined the content of others to arrive at more analytic categories. For example, the data collected through the "platform resources" and "type of intermediation" categories, were recombined in two other analytic categories: logistics operational and transactional support provided by the platforms. At the end of this process we had eight categories used to categorize the four types of crowd logistics (see Table 3). These two sets of results (characterizing crowd logistics in contrast to business logistics and identifying the four types) are described in the next two sections and ultimately led us to develop research propositions for future studies.

3. Crowd logistics versus business logistics

Through an in-depth analysis of the 57 initiatives, we identified the specificities of crowd logistics in comparison with traditional business logistics, as summarized in Table 2. The table deliberately highlights predominant (but non-exclusive) elements for both types of logistics. It allows us to propose the first conceptual definition of crowd-logistics: “Crowd logistics is done through collaborative platforms and mobile apps that connect individuals and firms to peers (travelers, movers, authorized drivers, owners of empty storage spaces, etc.) in order to make the best use of distributed, idle logistics resources and capabilities. Crowd logistics calls on individuals to perform basic logistics services on an ad-hoc basis”.

Table 2. Business logistics versus crowd logistics

		Dominant characteristics of business logistics	Dominant characteristics of crowd logistics
Strategic level	Players	Firms	Crowd
	Motivations	Economic	Multi-dimensional
	Scale	Large	Small
	Philosophy	Consolidation	Symbiosis
Organizational level	Orchestration	Centralized	Distributed
	Function of platform	Physical	Market mediation
	Activities	Wide-ranging	Basic
	Skills	Professional	Amateur
Operational Level	Assets	Specific	Generic
	Procedures	Standardized	Ad-hoc
	Information System	Software	Platforms and Apps
	Performance measurement	Quantitative (KPI)	Qualitative (stars and likes)

At the strategic level, crowd logistics initiatives build relations between individuals in the **crowd** and allow them to perform/buy logistics activities (“join the crowd-shipping revolution”—TinyCarrier). Such initiatives offer an explicit **economic** benefit for the people involved (“same day delivery at an affordable price for the consumer”—Deliv or “extra money for drivers”—Kanga) and obviously for the connecting platform via commissions, fees or advertising revenue. However, most of the time, the initiatives draw attention to other non-economic aspects, addressing **multi-dimensional** motivations for peers to join the initiative. Some highlight **environmental** benefits (“environmentally friendly delivery”—Piggybee) or **social** ties (“shop with your friends”—FriendShippr). Others offer **altruistic** experiences (“make someone happy when you travel”—TinyCarrier) or declare **political** commitments (“[we] began with a mission to empower local economies in a connected world”—Doordash). Crowd logistics relies on individuals

who are connected through mobile technologies and the focus is on **small-scale** operations (“deliveries are made within a 15-mile radius of the given pickup location”—Deliv; “Orders must meet the following requirement: weigh less than 6 kg.”—PickApp). On the whole, the philosophy of crowd logistics is to bring peers together in a network of **symbiotic** relationships (“connects people who need stuff moved with people on the move”—Meemeep) by matching logistics assets and capabilities with logistics needs. Crowd logistics thus seeks to minimize the inefficient use of assets (“we're here to add a dash of common sense to the self-storage industry”—Sharemystorage) and capitalize on idle capacity (“by renting out your unused space you can earn extra cash”—Storemates).

The organization of crowd logistics also exhibits specific features. First of all, flows are mainly **distributed** between a constellation of individuals through a peer-matching application (e.g., Myways) or bidding system (Meemeep), based on the shipper’s choice (Storenextdoor) or assignment by the platform (Doordash). Platforms mainly fulfill a **market mediation function** making the distribution of flows easier (“our smart algorithm makes sure that [...] the most suitable driver is chosen to fulfill the delivery”—Volo), by offering descriptions, localizations and ratings for supply and demand (“our on-demand delivery platform connects customers with local couriers”—Postmates). Most crowd logistics initiatives offer **basic logistics services**, mainly **transport or storage**, and to perform them they rely on individuals whose self-assessed, **amateur** logistics skills are not certified (“anyone with a vehicle and a customer-service mentality can get in on the action!”—Postmates). However, most platforms check driver’s licenses, insurance, proof of dependable vehicles, and advise drivers to link their registration with their Facebook account to establish a community of trust or their e-reputation profiles. Individuals perform logistics activities as “independent contractors” (Doordash). They are nicknamed “Roadies”, “Mywayers”, “Jwebbers”, etc., to build a strong sense of belonging to the logistics community gathered around the platform.

At the operational level, crowd logistics mainly relies on **generic**, non-specific assets. Crowd logistics leverages various means of locomotion (“transportation types: walk, bike, cargo bike, car, van, truck”—Zipment) or any potential storage space (“any part of your home — a loft, basement, spare room or garage... an uncovered space... driveway or forecourt for the storage of boats, caravans, motorhomes”—Storenextdoor). Such assets, which they may own, rent (“the member is the owner or tenant of a storage space”, Ouistock) or use (“if you have wheels or if you commute on public transport”, Meemeep), are **neither necessarily set up** for logistics activities, **nor fully dedicated** to that purpose and their use can evolve over time (from personal use to rental, for example). Similarly, crowd logistics operates on a case-by-case basis (“direct and customized services”—PickApp); standard packaging and transport orders are not compulsory. Services are delivered on an **ad-hoc** basis depending for example on shipment details and available drivers (“tell us what you need delivered, where to pick it up and where it's going. The app will notify you when drivers offer their services”—Kanga). The information systems for crowd logistics are **smartphone apps** (“integrate a world-class local delivery platform into your app”—Postmates) and **Internet platforms** (“out of space? List your storage space on our secure website for free”—Storemates). The **qualitative evaluation** of logistics service performance relies on the feedback individuals from the crowd leave for each other: rating systems based on points or stars (“you leave feedback for each other after the job is done in the form of a star rating and comments”—Rideship) and comments to improve the service and to build the reputation

of the crowd-logistician (“be sure to leave a review for the driver!”— Barnacle). Such rating systems potentially help to overcome perceived risks concerning the lack of reliability or professional competences of the crowd by giving high visibility to trustworthy peers and by identifying individuals to exclude from the community (“help build trust among our sharing community” —Storemates).

4. Four types of crowd logistics

The 57 crowd logistics initiatives studied can be grouped into four types depending on the nature of the logistics service they propose (see sample characterization in Table 1) crowd storage, crowd local delivery, crowd freight shipping and crowd freight forwarding. Each type presents some specific features in terms of: the types of items concerned; the types of logistics connections created; the logistics value for users; the logistics risks for users; the crowd physical resources activated; the crowd logistics capabilities required; the logistics operational support provided by the platform; the logistics transactional support provided by the platform (Table 3).

One type of crowd logistics initiative offers **storage services**. The provision of these services relies on property resources that the crowd has access to, such as cellars, spare rooms, garages or yards. Crowd resources are mobilized through a search engine that enables a client to geo-locate storage spaces uploaded by the crowd. Most of the offerings are in large cities, where high real estate prices push traditional business storage space to the outskirts. This type of crowd-service gives city dwellers access to low-cost proximity storage space where goods (furniture, cardboard boxes) can be stored for varying periods of time. The success of these initiatives depends on their ability to develop a sufficiently dense local network of storage spaces in each city. It also depends on the ability of the crowd to properly manage the storage spaces, ensuring that the goods stored are secure and easily accessible. The contribution of the platforms consists in helping the crowd in their storage management tasks, for example by supplying tools for assessing the volume of the goods to be stored and determining the right fees to charge. The platforms also may make sample contract clauses available to users and may recommend insurance services or provide protection guarantees to cover losses caused by damage or theft.

The second type of crowd logistics initiative offers **local delivery services**. The provision of these services relies on transport resources that the crowd has access to and makes use of individual logistics capabilities such as picking up goods, driving, and delivering. Transport resources can be vans, cars, scooters, bicycles, public transport or even walking. Initiatives in this field operate using smartphone applications, which enable peers to place delivery requests that are then fulfilled by other peers. They can also use software integrated in payment terminals, when local deliveries are carried out from a business location (restaurant, supermarket, etc.). Local delivery initiatives are mostly located in large cities, where thousands of people move around every day. The mobility of this urban crowd makes it possible to offer low-cost, fast delivery services, which are particularly attractive for parcel deliveries and for the distribution of consumer goods (flowers, groceries, etc.) or meals prepared by restaurants. The success of these initiatives depends on the ability to develop a sufficiently dense local network of delivery people in each city to ensure quick delivery. The contribution of the platforms is to equip the crowd with delivery aids and tools such as GPS systems, and to operate a dynamic system for real-time scheduling and routing to allocate clients’ delivery requests to drivers as efficiently as possible. Most platforms check drivers’ credentials (driving license, vehicle

ownership, for example) and enable customers to follow their driver in the real-time GPS map and to contact them directly, as rapidity and reliability are key components of this service.

Table 3. Four types of crowd logistics services

	Crowd storage	Crowd local delivery	Crowd freight shipping	Crowd freight forwarding
Types of items	Furniture Unused Cumbersome Archives	Food Parcels	Odd-sized Parcels	Valuables Light products Local products
Types of logistics connections	Proximity	Local Short distance	Long distance (domestic or continental)	Long distance (international or intercontinental)
Logistics value for users	Proximity	Speed	Adaptability	Accessibility
Logistics risk for users	Security (goods) Accessibility	Lack of trust in the crowd	Security (goods) Lack of trust in the crowd	Service reliability (customs and air-travel regulations)
Crowd physical resources	Cellars Lofts Rooms Garages Courtyards	Cars Vans (Motor)bikes Public transport	Cars Vans, Trucks Buses Trains	Planes Boats Luggage
Crowd logistics capabilities	Handling Storing	Pick up Driving Riding Delivering	Loading Driving Delivering	Handling Packing Completing formalities Delivering
Logistics operational support by the platform	Space calculation software	GPS Scheduling software	GPS	Customs process
Logistics transactional support by the platform	Insurance contract models	Pricing system Checking driver's licenses	Pricing scale, Checking driver's licenses	Customs duty calculation software

The third type of crowd logistics initiative offers **freight shipping services** within a country or continent. The provision of these services also relies on transport resources that the crowd has access to, mainly road vehicles (cars and vans). The connections between the driving crowd and the users of the service are established through the same type of Internet platforms or mobile apps. This type of shipping system seems particularly suitable for oversized or non-standard items that cannot be sent by post because of their unusual volume, which makes the use of standard services impractical or too expensive.

The success of these initiatives depends on the ability to activate a network of drivers who can pick up, carefully transport and deliver the products to the final destination on time, offering high adaptability to clients' needs (in terms of volume, type of freight, etc.). The shipping crowd comprises both professional drivers employed by courier companies, who have available space and time between two deliveries or idle return trips to fill in, and casual drivers from the crowd. The contribution of the platform is to provide the crowd with both a GPS system (that allows real-time tracking by the client) and a tool to estimate the cost of shipping based on object size and distance traveled. Moreover, they allow the sender to choose between several propositions and select the driver that meets their specific needs. They also offer insurance systems to replace or repair items that may be damaged in transit. The platforms may also request information from its crowd such as their driving license to ensure that the logistics tasks can be performed correctly.

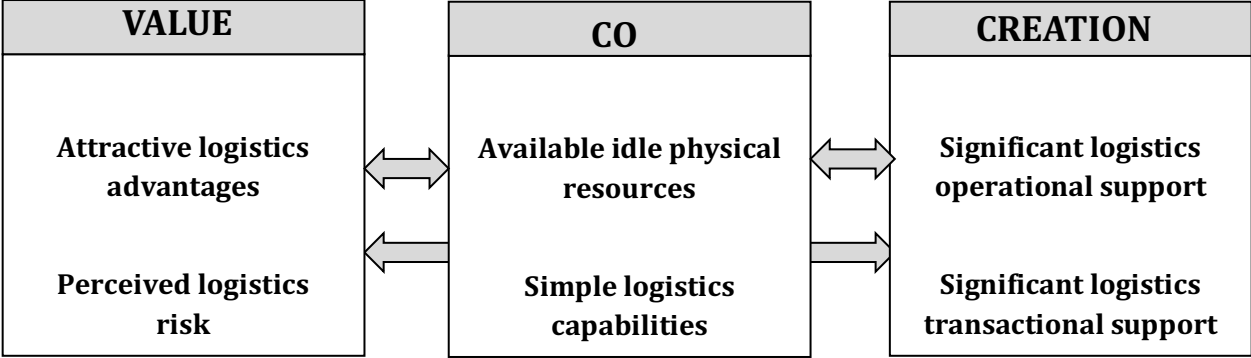
The fourth type of crowd logistics initiative offers **freight forwarding services**. These initiatives operate using search engines that match clients' requests to travelers' offers with the same origin and destination. Potential users of the service can place ads that inform the crowd of their own shipping needs, while peers post their forthcoming travel itineraries. These initiatives are deployed around the world and may have global coverage, although most of them are specialized in some connections. By activating the crowd of travelers, users also obtain preferential access to certain goods, such as products exclusively manufactured abroad, (e.g., food, fashion), or to items available at a lower cost due to different tax regimes (e.g., iPhone). The success of these initiatives depends on the crowd's ability to convey the required goods internationally. However, major risks and unexpected liabilities for the shippers may arise due to customs regulations and air-travel constraints. The contribution of the platform is to make the necessary information about such regulations and constraints available to the crowd, and to provide tools to calculate customs duties.

5. The crowd, a new player in the co-creation of logistics value

Our research demonstrates that ordinary individuals can take on some logistics tasks, play an unprecedented and active role in logistics, and thus be considered as active resources. To date, few logistics scholars have acknowledged this fact (Sampson, 2000; Goudarzi and Rouquet, 2009; Sampson and Spring, 2012). Generally, the final consumer is viewed as a passive actor to whom value must be delivered throughout the supply chain (e.g. Mentzer et al., 2001; Christopher, 2012), although some authors recognize that "today's consumer is empowered" (Fawcett et al., 2011, p. 117). In fact, the only stream of research in logistics currently emphasizing the active role of individuals is consumer logistics (Granzin and Bahn, 1989; Granzin et al., 1997; Granzin et al., 2005). This emerging approach (Teller et al., 2006, 2012; Monnot et al., 2014), points out that in order to meet their daily consumption needs, individuals already perform logistics activities using their own assets. Recent studies in consumer logistics (Bahn et al., 2015) build on the service-dominant logic framework developed in the marketing field by Vargo and Lusch (2004; 2008). In the service-dominant logic the consumer is no longer considered as an "operand resource" on which an operation can be performed, but as an "operant resource" (Constantin and Lusch, 1994). As a consequence, a fundamental premise of the framework is that the customer is a co-creator of value (Vargo and Lusch, 2008). An emerging challenge for companies is therefore to co-create value with consumers (Prahalad and Ramaswamy, 2004). Drawing on the framework for analyzing value co-creation proposed by Saarijärvi et al. (2013), our results allow us (Figure 1) to identify

and clarify the three components of value co-creation underpinning crowd logistics services: the “value” (What kind of value and for whom?), the “co” element (What kind of actors and resources?) and the “creation” (Through what kind of mechanisms?).

Figure 1. The crowd, a co-creator of logistics value



First, the “value” term: Crowd logistics offers new logistics value propositions, as per Vargo and Lusch (2008). As detailed previously in Section 4, four types of crowd logistics services are offered (storage, local delivery, freight shipping, freight forwarding) and each service is based on different types of logistics value propositions (proximity, speed, adaptability, accessibility), addressing different kind of needs and products. Each proposition exploits diverse advantages, is suitable for specific logistics flows and configurations and can be compared to existing logistics value propositions offered by traditional logistics services providers and firms. For example, crowd storage is a local service that is particularly suitable for city dwellers who need to store furniture; this service will compete with self-storage companies. The meaning and attractiveness of each logistics value proposition will be perceived differently by customers and determined on the basis of “value in use” (Lusch and Vargo 2006, p.284). However, each crowd logistics initiative presents some logistics risks that may undermine its value proposition as perceived by users. First, the security of goods can be compromised by the lack of dedicated and specialized physical assets, as crowd storage facilities may not be designed or equipped for commercial usage. Second, liability for damage to stored or transported goods, access to stored goods and the actual delivery of goods may have been overlooked. In the case of storage, for example, most homeowners’ and renters’ insurance policies do not cover commercial activities. The insurance services offered by the platform may only act as “secondary” coverage, pushing any claims through the crowd’s own insurance companies first, as has already been the case for Airbnb and Uber (The NYT, December 2014). With local crowd delivery, buyers must trust a virtual marketplace rather than placing responsibility on a traditional home-delivery company. Freight shipping shares both shortcomings: potential lack of service reliability and trust. Finally, in freight forwarding, users may consider compliance issues (customs rules, air travel regulations) to be a serious constraint. These considerations allow us to formulate a first set of two propositions — related to “value” — on the development of crowd logistics:

Proposition 1a: The development of crowd logistics initiatives is influenced by the perceived attractiveness of the logistics value proposition. The more attractive the logistics value proposition for users in terms of proximity, speed, adaptability or accessibility, the stronger the growth of the crowd logistics initiative.

Proposition 1b: The development of crowd logistics initiatives is influenced by the perceived risks of the logistics value proposition. The lower the risks perceived by users in terms of goods security, service reliability, trust in the crowd, the stronger the growth of the crowd logistics initiative.

Second, the “**co**” term: These value propositions rely on the crowd’s underused resources that can be activated to provide logistics services (Vargo and Lusch, 2008; Botsman and Rogers, 2010) and our research identifies the specific nature of these ordinary resources (Fréry et al., 2015). It shows that crowd logistics relies on two types of “logistics” resources: property resources (cellars, garages, etc.) and transport resources (muscle-power, bicycles, scooters, cars, vans, trains, airplanes, etc.). As in the new sharing economy, the challenge for a crowd initiative is to quickly gain a critical mass of users in order to benefit from “network externalities” (David, 1985). This depends on the availability of physical resources the crowd initiative is trying to build on. For instance, strong arms and cars — the physical resources that local delivery services try to build on — are by nature widely available. However, our research suggests that value creation depends not only on the availability of logistics resources (whether physical or IT related), but also on the crowd’s logistics capabilities (Prahalad and Ramaswamy, 2000). While several studies, in crowdsourcing, for example, point out that the crowd possesses a wide range of innovation capabilities (Djelassi and Decoopman, 2013) such as the ability to produce original, creative ideas (Schlagwein and Bjørn-Andersen, 2014) or the ability to solve enigmatic problems (Boudreau and Lakani, 2013), our research stresses the importance of the operant crowd’s logistics capabilities. Recruiting competent drivers for local delivery can be considered easy, because the required logistics capabilities are very basic, relying mainly on the abilities involved in picking up and delivering items. Some other activities such as freight forwarding will be more difficult, because the expected logistics capabilities are more complex: they involve the crowd’s skills in handling, packing, completing formalities and delivering. Based on these considerations, we formulate a second set of propositions — related to the “co” element— on the potential development of crowd logistics:

Proposition 2a: The development of crowd logistics initiatives is influenced by the availability of idle physical resources. The greater the availability of physical idle resources, the stronger the growth of the crowd logistics initiative.

Proposition 2b: The development of crowd logistics initiatives is influenced by the nature of the logistics tasks executed by the operand crowd. The easier the logistics tasks for the operand crowd, the stronger the growth of the crowd logistics initiative.

Third, the “**creation**” term: our research highlights the mechanisms through which platforms make the crowd’s resources operant (Constantin and Lusch, 1994; Vargo and Lusch, 2008) and active in the value-creation process. Connecting providers to users, multisided platforms (Kohler, 2015) are key players, true strategic resources (Fréry et al., 2015), and they mediate between the crowd and consumers. While the literature emphasizes the importance of ensuring the security of financial transactions to develop trust within the crowd (Weber, 2014), our research suggests that, in the specific field of crowd logistics, it is also essential for the platform to provide logistics resources to the crowd. First, the platform needs to provide logistics operational support to the crowd. The nature of this operational support varies depending on the initiative; it may include tools

to calculate storage space (crowd storage), scheduling software (crowd local delivery), GPS systems (crowd freight shipping) or customs processing assistance (crowd freight forwarding), thus helping the crowd to offer and provide the logistics service to the users. Second, the platform also needs to provide logistics transactional support to the crowd and to users, to facilitate and secure the relationships between them. This may include tools to calculate the cost of a delivery (crowd freight shipping), insurance contracts (crowd storage), a pricing system (crowd local delivery), or tax calculation software (crowd freight forwarding). Based on these considerations, we formulate a last set of two propositions — related to the “creation” element — on the potential development of crowd logistics:

Proposition 3a: The development of crowd logistics initiatives is influenced by the logistics support provided by the platform. The greater the logistics support in terms of scheduling, tracking, tracing systems and calculation tools, the stronger the growth of the crowd logistics initiative.

Proposition 3b: The development of crowd logistics initiatives is influenced by the transactional support provided by the platform. The greater the transactional support in terms of insurance, contracts, legal assistance, the stronger the growth of the crowd logistics initiative.

6. The potential impact of crowd logistics on traditional businesses

Crowd practices and the new intermediation modalities they are associated with (Gansky, 2010) may have a disruptive impact on traditional capital-based economies (Erving, 2014). Pwc (Hawksworth and Vaughan, 2015) estimates that by 2025 the sharing economy could generate over half of total sales in various rental sectors. Studying investor’s choices, Libert et al. (2014) show that network orchestrators, defined as firms that “create a network of peers in which the participants interact and share the value creation” (p.3), outperform traditional companies on both compound annual growth rate and profit margins. In the hospitality sector, Zervas et al. (2014) note that in some US cities, Airbnb sales increased by up to 300% in one year while hotel revenues dropped by 15%. At the moment, the revenues and market share of crowd logistics initiatives are generally speaking either insignificant or have not yet been calculated. However, our research has led us to formulate six theoretical propositions on the potential development of crowd logistics (section 5). Taking all of these propositions into consideration, it seems likely that the crowd logistics service that will probably have the strongest impact in the future is crowd local delivery. As a consequence, a disruptive impact of crowd logistics on traditional businesses is likely to be observed among logistics service providers that focus on “last-mile” delivery and among retailers.

Local delivery can include last-mile delivery for e-commerce, which still presents many challenges (Delfmann et al., 2002; Esper et al., 2003) and delivery for urban brick-and-mortar shops and services. Consumers have increasingly demanding expectations for local delivery in terms of speed (less than one-hour delivery for example) and innovation (Smartphone connection with the courier, secure locker systems, etc.). The value proposition of crowd local delivery clearly satisfies these two criteria. Meanwhile, as Botsman (2014b) notes, in numerous markets there are no firms offering last-mile delivery and people have to pick up their parcels at a designated spot, which makes for a frustrating customer experience. Once again, crowd local delivery may be considered a

suitable option, especially in rural territories where distribution networks are not so well developed. Moreover, local delivery relies on widely available physical logistics resources and simple tasks that do not depend on heavy infrastructure. Handling these basic tasks on a large scale requires substantial resources (Schenk and Guittard, 2011), which makes crowd logistics relevant, as it mobilizes a large number of individual providers. The potential lack of trust in crowd delivery people is being tackled the same way crowd companies deal with this issue in other industries (such as BlaBlaCar or Airbnb) by relying on their popular reputations (Owyang and Samuel, 2015): online rating systems are used to introduce “a feeling of familiarity, normality, and routine to the process of ordering online services’ (Slee 2015, p. 86). Of all the crowd logistics services, we ‘forward think’ that crowd local delivery has the greater potential for development. Some initiatives have already reached an impressive size (Deliv, Postmates) and e-commerce giants like Amazon also operate their own crowd fleet to provide similar services.

Consumers may of course also consider storage services offered by the crowd as an attractive option due to their features and benefits (proximity, price, flexibility of offers, etc.). But it seems to be a niche market for individual consumers. Idle physical resources are not so numerous in urban zones where the needs are critical, the logistics tasks to perform are more complex and the question of risk and access to the stored goods for the client may also constitute constraints. Another niche market is that of crowd freight shipping, whose services may be attractive for the limited shipping market of oddly-sized goods that may be too costly to move with traditional business services. Finally, even though firms specialized in long-distance and express parcel shipping (Carbone and Stone, 2005), known as “integrators” (Hertz and Alfredsson, 2003), such as Fedex and UPS, are explicit targets for some crowd logistics initiatives that urge peers to “avoid those outrageous 'express' or 'priority' costs” (Rideship), the transfer of these international freight forwarding activities to the crowd is highly constrained by perceived risks, by aircraft security, responsibility and safety issues. In particular, the operant crowd has to be very cautious not to agree to ship items which may be of a hazardous nature or prohibited by law. The need to achieve high density in the marketplace to make the service reliable and attractive for consumers is also another impediment for this type of service. Therefore its expansion may eventually focus on high-traffic lines between a limited number of origins and destinations (e.g., Paris–New York), just like maritime shipping lines.

On the whole, crowd logistics initiatives can be considered as new entrants in the logistics service industry and they may represent a threat that traditional LSPs should consider. LSPs may be vulnerable to crowd logistics initiatives since the competition among LSPs has constantly increased in recent decades (Wallenburg, 2009) and many users of LSP services are dissatisfied (Wong and Karia, 2010). Moreover, Bellingkrodt and Wallenburg (2013) remind us that LSPs are not very innovative and are often short-sighted with respect to market trends and new technologies. The threat represented by crowd local delivery seems particularly high for urban players that offer basic logistics services (mainly transportation and warehousing), such as the “basic logistics operator” (Persson and Virum, 2001) who combines low asset specificity and low service complexity. However, the development of crowd logistics may also create opportunities for LSPs who could be inspired to interact with and/or integrate crowd logistics systems. Acting as “orchestrators” (Zacharia et al., 2011) in these new crowd-involved supply chains, LSPs could coordinate the basic logistics services performed by the crowd with their own

variety of integrated services (Wanke et al., 2007). Working together within the chain (Vivaldini et al., 2008), LSPs and individuals could provide tailored logistics services for the final consumer. Finally, LSPs could help consumers to bypass existing supply chains (Carbone et al., 2015), and the crowd could help LSPs to differentiate themselves from their competitors. By implementing crowd logistics practices, LSPs could “get a convenient and simple opportunity to serve the customer while creating the image of a customer- and environmentally-friendly company” (Mladenow, 2015, p. 248).

Crowd local delivery initiatives can also be looked at as new entrants in extended supply chains and may impact the power relationships existing among actors (Cox et al., 2003). Based on our analysis that crowd local delivery will experience the strongest growth of the four types, the supply chain members most likely to be deeply impacted in the future are retailers. Delivery to the customer’s door is “logistically challenging and potentially very expensive” (Boyer et al., 2009, p.185). Crowd local delivery may help to resolve some of these issues such as low customer density in some geographical areas, secure reception and returns, and also make same-day delivery possible. Crowd local delivery start-ups are conducting very aggressive marketing campaigns (viral communication, branded vans, etc.) in order to become a new intermediary between consumers and retailers. If they succeed, the latter run the risk of losing their direct link with customers, and giving up some bargaining power to powerful crowd-based logisticians (e.g. Instacart in the U.S.). Some big retailers have already reacted to such threats by developing their own crowd-based delivery solutions. In June 2016 Wal-Mart announced that it will be partnering with Uber, Lyft and Deliv to test same-day grocery deliveries. Amazon has looked at this new way of broadening its delivery base while cutting costs using crowd-sourced drivers and has developed its own peer-matching application called Flex [*The Wall Street Journal*, June 16, 2015], which launched in Seattle in 2015 and in Great Britain last July. Hybridization between crowd logistics and traditional retailing can take other forms and involve several types of actors. Some high tech start-ups (e.g. Stuart) are targeting local shops and e-commerce companies to sell them an integrated information system to match peers and offer a crowd delivery service. Other initiatives (e.g. Deliv) have designed a crowd-sourced same-day delivery service for multinational retail chains letting retailers maintain control over final deliveries, while the delivery crowd acts as a simple carrier. On the whole, as summed up by Hubner et al. (2016), retailers and logistics service providers should not underestimate this burgeoning delivery mode (Estelle-Arojas et al., 2012), considered as an advanced, innovative concept of home delivery (Hubner et al., 2016).

Conclusions

This paper has defined and characterized a new form of emerging crowd practice: crowd logistics, which taps into the crowd’s idle resources and underused logistics capabilities through mobile connections and online platforms. Specifically, it has investigated 57 initiatives to better trace the fuzzy boundaries of this new industry. After conducting an exploratory analysis of the websites of these initiatives, we have proposed an initial conceptualization of crowd logistics and a classification containing four different types of services. We have outlined the main differences with traditional business logistics, and investigated the potential impact of crowd logistics upon LSPs and retailers. At a theoretical level, we have developed a framework for logistics value co-creation, which

has led to the formulation of a series of six propositions on the factors influencing the development of crowd logistics. This framework responds to the call in the logistics and SCM field to move away from a value-creation paradigm to one of value co-creation (Lusch, 2011; Lusch et al., 2014). It illustrates the multifaceted nature of each of the value co-creation components (Grönroos and Ravald, 2011) and helps to conceptualize crowd logistics as a complex system and network rather than as a dyad or as a sequential segment of the chain (Lusch, 2011; Carter et al., 2015). It also reveals how the synergistic effects (Lusch et al., 2010) of crowd logistics are generated through repeated interactions among the platforms, the crowd and its own logistics resources and capabilities.

This research presents several limitations, mainly related to methodology, which was based on the analysis of 57 crowd logistics websites. Websites are designed to attract users and this can lead to the collection of biased information. Moreover, we have not been able to thoroughly assess the commercial and financial results of some of the initiatives. Examining official financial statements and conducting face-to-face interviews could help to determine the keys to success of crowd logistics initiatives. In a similar vein, an empirical approach to investigating the value co-creation processes involving the platform, the crowd and customers is necessary to test our theoretical propositions and strengthen, through primary data collection, the validity of our theoretical framework, which has been developed through secondary and declarative data. However, our exploratory results open several potential research areas at the crossroads of crowd perspectives and well-researched topics within the logistics field.

Crowd logistics initiatives are part of global societal evolution and their development will obviously be affected by the development of other crowd practices (crowd sourcing, crowd funding, etc.) and the rise of the new sharing economy. The latter mainly relies on trust, broadly considered as its main pillar (Gansky, 2010) but now increasingly perceived as one of its dark sides (Slee, 2015). Some authors (Murillo et al., 2016) and consumer organizations (BEUC 2016) suggest that users only rely on a pretense of trust. If the myth of peer-to-peer trust were to be undermined, the development of crowd logistics could be seriously affected. Accordingly, it would be interesting to study the conditions under which the collapse of the trust-based image of the sharing economy could affect the development of emergent crowd-logistics.

From a human resources management perspective, crowd logistics initiatives are introducing new job options for “lifestyle” logisticians (students, freelancers, etc.) and professional workers at an average of \$20/hour (“Make \$18–25/hr delivering packages for Amazon with your car and smartphone”). They promote high levels of flexibility and self-defined working hours in demanding, regulated and “inherently social” logistics systems (Fawcett et al., 2011, p. 117) that are still suffering from staffing issues (Ellinger et al., 2010). But they can also be blamed for transferring the entire business risk to “micro entrepreneurs” (Standing, 2014), with a lower level of social protection (unemployment insurance, healthcare, pension, etc.) when compared to traditional employees, or for doubly exploiting individuals as employees and consumers (Cova and Dalli, 2007). Whether their effects will create/destroy logistics employment, transform logistics skills and be beneficial to the working peers or to the platform deserves further research.

Crowd logistics is also expected to have an important impact on sustainable logistics. The increasing scale, complexity and performance of traditional business logistics (Mollenkopf et al., 2010) has reached a stage where growth has run up against

environmental challenges, increasing (urban) congestion (McKinnon et al., 2012), energy inefficiency (Halldorsson and Kovacs 2010) and rising costs. Conversely, crowd logistics harnesses the dormant logistics resources of individuals. Handling, storing and transporting goods through a web of individuals could benefit local and global economies, cut greenhouse gas emissions and may reduce the necessity for new investment in logistics infrastructure. From this perspective, crowd logistics appears to fit the “small is beautiful” paradigm (Schumacher, 2011). Future research could investigate the potential of crowd logistics to improve sustainability and should take both logistics firms and individuals into account when studying sustainability.

Along with sustainability, global logistics integration is a key objective of logistics management (Mentzer et al., 2001; Christopher, 2012). Many researchers consider that integration increases performance (Stevens, 1989; Lee, 2000), but is difficult to achieve (Fawcett and Magnan, 2002) because it impacts physical flows between several organizational layers (Fabbe-Costes and Jahre, 2008; Naslund and Williamson, 2008). Crowd logistics introduces a new layer that has not been considered in the literature on supply chain integration; it adds the crowd to the “logistics service supply chain, forming a vertical network” (Cui and Hertz, 2011, p. 1005). Consequently, crowd logistics initiatives are altering the context of logistics integration and making it more complex. Future research will need to tackle this complexity.

Finally, crowd logistics offers new opportunities in terms of teaching and could be included in supply chain teaching frameworks (Johnson and Pyke, 2000). Relevant logistics teaching that promotes experiential learning activities (Fawcett and Waller, 2015) might encourage students to join or launch crowd logistics initiatives as an experiential alternative to commercial simulation software (Sweeney et al., 2010). Students would then acquire the competences to become crowd logistics entrepreneurs or help established LSPs deal with this exciting new challenge.

References

- Avelino, A., Dumitru, A., Longhurts, N., Wittmayer, J., Hielscher, S., Weaver, P., Cipolla, C., Afonso, R., Kunze, I., Dorland, J., Elle, M., Pel, B., Strasser, T., Kemp, R., and Haxeltine, A. 2015. "Transitions towards 'new economies'? A transformative social innovation perspective." TRANSIT working paper #4 (September) 1–27.
- Bahn, K.D., Granzin, K.L., and Tokman, M. 2015. "End-user contribution to logistics value co-creation: A series of exploratory studies." *Journal of Marketing Channels* 22(1): 3–26.
- Belk, R. 2010. "Sharing." *Journal of consumer research*, 36(5): 715–734.
- Belk, R. 2014. "You are what you can access: Sharing and collaborative consumption online." *Journal of Business Research* 67(8): 1595–1600.
- Belleflamme, P., Lambert T., and Schwienbacher, A. 2014. "Crowdfunding: Tapping the right crowd." *Journal of Business Venturing* 29(5): 585–609.
- Bellingkrodt, S., and Wallenburg, C. M. 2013. "The role of external relationships for LSP innovativeness: A contingency approach." *Journal of Business Logistics* 34(3): 209–21.
- Berthon, P., Pitt, L., and Campbell, C. 2008. "Ad lib: When customers create the ad." *California Management Review* 50(4): 6–30.
- BEUC, 2016. "Collaborative Economy". BEUC position paper. Published by The European Consumer Organisation (BEUC) April, 2016. Available at http://www.beuc.eu/publications/beuc-x-2016-030_gbe_collaborative_economy_beuc_position.pdf. (Accessed on 1st October, 2016).
- Botsman, R. 2014a. "Crowdshipping: using the crowd to transform delivery." *AFR Boss Magazine*, September 19.
- Botsman, R. 2014b. "Collaborative logistics. Ripe for disruption." Featured Content Perspectives, October, <http://www.collaborativeconsumption.com/2014/10/08/collaborative-logistics-ripe-for-disruption/>.
- Botsman, R., and Rogers R. 2010. *What's mine is yours. The Rise of Collaborative Consumption*. New York: Harper Business.
- Boudreau, K. J., and Lakhani, K. R. 2013. "Using the crowd as an innovation partner." *Harvard Business Review* 91(4): 60–69.
- Boyer, K.K., Prud'Homme, A.M., and Cheung, W. 2009. "The last mile challenge: evaluating the effects of customer density and delivery window patterns." *Journal of Business Logistics* 30(1):187–201.
- Bubner, N., Bodenbenner, P., and Noronha, J. 2016. "Logistics Trend Radar." *DHL Trend Research*, available on DHL.com.
- Bubner, N., Bubner, N., Helffig, R., and Jeske, M. 2014. "Logistics Trend Radar." *DHL Trend Research*, available on DHL.com.

- Calantone, R. J., and Vickery, S. K. 2010. Introduction to the special topic forum: Using archival and secondary data sources in supply chain management research. *Journal of Supply Chain Management* 46(4): 3–11.
- Carbone, V., and Stone, M.A. 2005. “Growth and relational strategies used by the European logistics service providers: Rationale and outcomes.” *Transportation Research Part E: Logistics and Transportation Review* 41(6): 495–510.
- Carbone, V., Rouquet, A., and Roussat, C. 2015. "Carried away by the crowd: what types of logistics characterise the collaborative economy?" 1st International Workshop on Sharing Economy, Utrecht, 4–5 June.
- Carter, C. R., Rogers, D. S., and Choi, T. Y. 2015. “Toward the theory of the supply chain.” *Journal of Supply Chain Management* 51(2): 89–97.
- Chen, C., Cheng, S. F., Gunawan, A., Misra, A., Dasgupta, K., and Chander, D. 2014. "TRACCS: Trajectory-aware coordinated urban crowd-sourcing." Second AAAI Conference on Human Computation and Crowdsourcing (HCOMP-14).
- Christopher, M. 2012. *Logistics and supply chain management*. London: Pearson UK.
- Collm, A., and Schedler, K. 2012. “Managing crowd innovation in public administration.” *International Public Management Review* 13(2): 1–18.
- Constantin, J. A., and Lusch, R. 1994. *Understanding Resource Management*. Oxford, OH: The Planning Forum.
- Cova, B., and Dalli, D. 2007. “Community made: From consumer resistance to tribal entrepreneurship.” In *European Advances in Consumer Research*, edited by M.A. McGrath, S. Borghini, and C. Otnes, Duluth, MN: Association for Consumer Research.
- Cox, A., Ireland, P., Lonsdale, C., Sanderson, J., and Watson, G. 2003. *Supply chains, markets and power: Managing buyer and supplier power regimes*. New York: SUNY Press.
- Cui, L., and Hertz, S. 2011. “Networks and capabilities as characteristics of logistics firms.” *Industrial Marketing Management* 40(6): 1004–1011.
- David, P. A. (1985). “Clio and the Economics of QWERTY.” *The American Economic Review*, 75(2): 332–337.
- Delfmann, W., Albers, S., and Gehring, M. 2002. “The impact of electronic commerce on logistics service providers.” *International Journal of Physical Distribution & Logistics Management* 32(3): 203–222.
- Djelassi, S., and Decoopman, I. 2013. “Customers' participation in product development through crowdsourcing: Issues and implications.” *Industrial Marketing Management* 42(5): 683–692.
- Eisenhardt, K., and Graebner, M. 2007. “Theory building from cases: opportunities and challenges.” *Academy of Management Journal* 50(1): 25–32.

- Ellinger, A. E., Keller, S. B., and Elmadag Bas, A.B. 2010. "The empowerment of frontline staff in 3PL companies." *Journal of Business Logistics* 31(1): 79–98.
- Ellinger, A.E., Lynch, D.F., Andzulis, J.K., and Smith, R.I. 2003. "B-to-B e-commerce: A content analytical assessment of motor carrier websites." *Journal of Business Logistics* 24(1): 999–220.
- Emerson, C.J., and Grimm, C.M. 1998. "The relative importance of logistics and marketing customer service: a strategic perspective." *Journal of Business Logistics* 19(1): 17–32.
- Erving, E.E. 2014. *The Sharing Economy: Exploring the Intersection of Collaborative Consumption and Capitalism*. Scripps Senior Theses, Paper 409. http://scholarship.claremont.edu/scripps_theses/409
- Esper, T. L., Jensen, T. D., Turnipseed, F. L., and Burton, S. 2003. "The last mile: an examination of effects of online retail delivery strategies on consumers." *Journal of Business Logistics* 24 (2): 177–203.
- Estellés-Arolas, E., and González-Ladrón-de-Guevara, F. 2012. "Towards an integrated crowdsourcing definition." *Journal of Information Science* 38 (2): 189–200.
- Fabbe-Costes, N., and Jahre, M. 2008. "Supply chain integration and performance: a review of the evidence." *International Journal of Logistics Management* 19(2): 130–154.
- Fawcett, S. E., and Waller, M. A. 2015. "The quest for societal ROI in the midst of the perfect storm: Can SCM set the standard for twenty-first century business education?" *Journal of Business Logistics* 36(1): 1–8.
- Fawcett, S. E., Waller, M.A., and Bowersox, D.J. 2011. "Cinderella in the c-suite: conducting influential research to advance the logistics and supply chain disciplines." *Journal of Business Logistics* 32(2): 115–121.
- Fawcett, S.E., and Magnan, G.M. 2002. "The rhetoric and reality of supply chain integration." *International Journal of Physical Distribution & Logistics Management*, 32(5): 339–361.
- Fréry, F., Lecocq, X., and Warnier, V. 2015. "Competing with ordinary resources." *MIT Sloan Management Review* (Spring): 1–11.
- Gansky, L. 2010. *The mesh: Why the future of business is sharing*. New York: Penguin.
- Gouadarzi, K., and Rouquet, A. 2009. "The logistics roles of the final customer in the supply chain: proposal of an exploratory typology." 16th Euroma Conference, Goteborg, 14–17 June, Goteborg (Sweden).
- Granzin, K.L., and Bahn, K.D. 1989. "Consumer logistics: conceptualization, pertinent issues and a proposed program for research." *Journal of the Academy of Marketing Science* 17(1): 91–101.
- Granzin, K.L., Painter, J.J., and Bahn, K.D. 2005. "An empirical test of households' participation in the distribution supply chain process." *Journal of Marketing Channels* 14(4): 67–89.

- Granzin, K.L., Painter, J.J., and Valentin, E.K. 1997. "Consumer logistics as a basis for segmenting retail markets. An exploratory inquiry." *Journal of Retailing and Consumer Services* 4(2): 99–107.
- Grönroos, C., and Ravald, A. 2011. "Service as business logic: implications for value creation and marketing." *Journal of Service Management* 22(1): 5–22.
- Halldórsson, Á., and Kovács, G. 2010. "The sustainable agenda and energy efficiency: Logistics solutions and supply chains in times of climate change." *International Journal of Physical Distribution & Logistics Management* 40(1/2): 5–13.
- Hawksworth, J., and Vaughan, R. 2015. "The sharing economy, sizing the revenue opportunity." Issues/Megatrends/Collisions.
<http://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy/the-sharing-economy-sizing-the-revenue-opportunity>.
- Hertz, S., and Alfredsson, M. 2003. "Strategic development of third-party providers." *Industrial Marketing Management* 32(2): 139–149.
- Howe, J. 2006. "The Rise of Crowdsourcing." *Wired* 14.06.
<http://www.wired.com/wired/archive/14.06/crowds.html>.
- Howe, J. 2008. *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business*, New York: Random House Business.
- Hubner, A.H., Kuhn, H., and Wollenburg, J. 2016. "Last-mile fulfilment and distribution in omni-channel grocery retailing: A strategic planning framework." *International Journal of Retail and Distribution Management* 44(3): 228–247.
- Johnson, M. E., and Pyke, D. F. 2000. "A framework for teaching supply chain management." *Production and Operations Management* 9(1): 2–18.
- Ketokivi, M., and Choi, T. 2014. "Renaissance of case research as a scientific method." *Journal of Operations Management* 32 (5) 232–240.
- Kohler, T. 2015. "Crowdsourcing-based business models: how to create and capture value." *California Management Review* 57 (4) Summer. 62–84.
- Kozinets, R.V. 2002. "The field behind the screen: Using netnography for marketing research in online communities." *Journal of marketing research* 39(1): 61–72.
- Krauth, E., Van Hillegersberg, J., and Van de Velde, S.L. 2007. "Research in logistics service providing. A meta-analysis." In *Managing Supply Chains*, edited by R. De Koster, and W. Delfmann, 129–144. Copenhagen Business School Press.
- Lee, H.L. 2000. "Creating value through supply chain integration." *Supply Chain Management Review* 4(4): 30–40.
- Lewis, M. W. 1998. "Iterative triangulation: a theory development process using existing case studies." *Journal of Operations Management* 16(4): 455–469.
- Libert, B., Wind, Y., and Beck, M. 2014. "What Airbnb, Uber, and Alibaba have in common." *Harvard Business Review* November 20.

- Lusch, R.F., and Vargo, S.L. 2006. "Service-dominant logic: reactions, reflections and refinements." *Marketing theory* 6(3): 281–288.
- Lusch, R.F., Vargo, S.L., and Tanniru, M. 2010. "Service, value networks and learning." *Journal of the academy of marketing science* 38(1): 19–31.
- Lusch, R.F. 2011. "Reframing supply chain management: a service dominant logic perspective." *Journal of Supply Chain Management* 47(1):14–18.
- Lusch, R.F., Vargo, S. L., and Fisher, R. 2014. "Drawing on service-dominant logic to expand the frontier of physical distribution and logistics management." *International Journal of Physical Distribution & Logistics Management* 44(1/2): 1–5.
- Mehmann, J., Frehe, V., and Teuteberg, F. 2015. "Crowd logistics – a literature review and maturity model." In *Proceedings of the Hamburg International Conference on Logistics (HCL). Innovations and strategies for logistics and supply chains*, edited by W. Kersten, T. Blecker, and C.M. Ringler, 117–145.
- Mladenow, A., Bauer, C., and Strauss, C. 2015. "Crowdsourcing in logistics: Concepts and applications using the social crowd." *ICPS - International Conference Proceedings Series*, edited by M. Indrawan-Santiago, M. Steinbauer, I. Khalil, and G. Anderst-Kotsis, 244–251. ACM
- McKinnon, A., Browne, M., and Whiteing, A. 2012. *Green logistics: Improving the environmental sustainability of logistics*. New Delhi: Kogan Page Publishers.
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D., and Zacharia, Z.G. 2001. "Defining supply chain management." *Journal of Business Logistics* 22(2): 1–25.
- Mollenkopf, D., Stolze, H., Tate, W.L., and Ueltschy, M. 2010. "Green, lean, and global supply chains." *International Journal of Physical Distribution & Logistics Management* 40(1/2): 14–41.
- Mollick, E. 2014. "The dynamics of crowdfunding: An exploratory study." *Journal of Business Venturing* 29(1): 1–16.
- Monnot, E., Reniou, F., and Rouquet, A. 2014. "Recycling household waste: A classification of the logistics used by consumers." *Recherche et Applications en Marketing (English Edition)* 29(3): 75–97.
- Murillo, D., Buckland, H. and Val, E. 2016 "When the sharing economy becomes neoliberalism on steroids: Unravelling the controversies." 32nd EGOS Colloquium, Naples, July 7–9.
- Naslund, D., and Williamson, S.A. 2008. "Supply chain integration: Barriers and driving forces in an action research-based industry intervention." *Supply Chain Forum: International Journal* 9(1): 70–80.
- Ordanini, A., Miceli, L., Pizzetti, M., and Parasuraman, A. 2011. "Crowd-funding: transforming customers into investors through innovative service platforms." *Journal of Service Management* 22(4): 443–470.

- Owyang, J., and Samuel, A. 2015. "The new rules of the collaborative economy." *Crowd Companies & Vision Critical*. Available from <https://www.visioncritical.com/resources/new-rules-collaborative-economy/>.
- Persson, G., and Virum, H. 2001. "Growth strategies for logistics service providers: a case study." *The International Journal of Logistics Management* 12(1): 53–64.
- Prahalad, C.K. and Ramaswamy, V. 2004. *The Future of Competition - Co-Creating Unique Value With Customers*. Boston, MA: Harvard Business School Press.
- Rabinovich, E., and Cheon, S. 2011. "Expanding horizons and deepening understanding via the use of secondary data." *Journal of Business Logistics* 32(4): 303–316.
- Sampson, S., and Spring, M. 2012. "Customer roles in service supply chains and opportunities for innovation." *Journal of Supply Chain Management* 48(4): 30–50.
- Sampson, S.E. 2000. "Customer-supplier duality and bidirectional supply chains in service organizations." *International Journal of Service Industry Management* 11(4): 348–364.
- Saarijärvi, H., Kannan, P. K., and Kuusela, H. 2013. "Value co-creation: theoretical approaches and practical implications". *European Business Review* 25(1): 6–19.
- Schenk, E., and Guittard, C. 2011. "Towards a characterization of crowdsourcing practices." *Journal of Innovation Economics and Management* 1(7): 93–107.
- Schlagwein, D., and Bjørn-Andersen, N. 2014. "Organizational learning with crowdsourcing: The revelatory case of LEGO." *Journal of the Association for Information Systems* 15(11): 754–778.
- Schor, J. 2014. "Debating the sharing economy." *Great Transition Initiatives*, October. <http://www.greattransition.org/publication/debating-the-sharing-economy>.
- Schulze, T., and Schader, M. 2011. "Managing the crowd: towards a taxonomy of crowdsourcing processes." Proceedings of the Seventeenth Americas Conference on Systems, Detroit, Michigan, August 4th–7th.
- Schumacher, E.F. 2011. *Small is beautiful: a study of economics as if people mattered*. London: Random House.
- Standing, G. 2014. *The Precariat: The New Dangerous Class*. London: Bloomsbury Academic.
- Seuring, S., and Gold, S. 2012. "Conducting content-analysis based literature reviews in supply chain management." *Supply Chain Management: An International Journal* 17(5): 544–555.
- Slee, T. 2015. *What's Yours Is Mine: Against the Sharing Economy*. New York and London: OR Books.
- Stevens, J. 1989. "Integrating the supply chain." *International Journal of Physical Distribution and Materials Management* 19(8): 3–8.
- Sundararajan, A. 2016. *The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism*. Boston: MIT Press.

- Sweeney, D., Campbell, J., and Mundy, R. 2010. "Teaching supply chain and logistics management through commercial software." *The International Journal of Logistics Management* 21(2): 293–308.
- Teller, C., Kotzab, H., and Grant, D.B. 2006. "The consumer direct services revolution in grocery retailing: an exploratory investigation." *Managing Service Quality* 16(1): 78–96.
- Teller, C., Kotzab, H., and Grant, D.B. 2012. "The relevance of shopper logistics for consumers of store-based retail formats." *Journal of Retailing and Consumer Services* 19(1): 59–66.
- Thomas, D.R. 2006. "A general inductive approach for analyzing qualitative evaluation data." *American Journal of Evaluation* 27(2): 237–246.
- Vargo, S.L., and Lusch, R.F. 2004. "Evolving to a new dominant logic for marketing." *Journal of Marketing* 68(1):1–18.
- Vargo, S.L., and Lusch, R.F. 2008. "Service-dominant logic: continuing the evolution." *Journal of the Academy of Marketing Science* 36(1): 1–10.
- Vivaldini, M., Pires, S. R. I., and De Souza, F. B. 2008. "Collaboration between 4PL and 3PL: a study within the fast food industry." 7th International Meeting for Research in Logistics, Avignon, 24–26.
- Voss, C., Tsiriktsis, N., and Frohlich, M. 2002. "Case research in operations management." *International Journal of Operations & Production Management* 22 (2):195–219.
- Wallenburg, C. 2009. "Innovation in logistics outsourcing relationships: proactive improvement by logistics service providers as a driver of customer loyalty." *Journal of Supply Chain Management* 45(2): 75–93.
- Wanke, P., Arkader, R., and Fernanda Hijjar, M. 2007. "Logistics sophistication, manufacturing segments and the choice of logistics providers." *International Journal of Operations and Production Management* 27(5): 542–559.
- Weber, T.A. 2014. "Intermediation in a sharing economy: insurance, moral hazard, and rent extraction." *Journal of Management Information Systems* 31(3): 35–71.
- Wong, C.Y., and Karia, N. 2010. "Explaining the competitive advantage of logistics service providers: A resource-based view approach." *International Journal of Production Economics* 128(1): 51–67.
- Yin, R. 2014. *Case study research: Design and methods*. 5th Edition, Sage Publications: Thousand Oaks, CA.
- Zacharia, Z.G., Sanders, N.R., and Nix, N.W. 2011. "The emerging role of the third-party logistics provider (3PL) as an orchestrator." *Journal of Business Logistics* 32(1): 40–54.
- Zervas, G., Proserpio, D., and Byers, J. 2014. "The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry." Boston University School of Management Research Paper Series: 2013–16.

Table 1. List of the 57 crowd logistics initiatives studied

Name	URL Link	Creation	Country	Type of service
Backpackbang	https://www.backpackbang.com/	2013	US/ Bangladesh	Freight Forwarding
Barnacle	http://p2ppostal.appspot.com/	2013	US	Freight Shipping
Bistip	http://www.bistip.com/	2011	Indonesia	Freight Forwarding
BonCarry	http://boncarrytestapp.appspot.com/	2015	Spain	Freight Forwarding
Bringbee	http://www.bringbee.ch/	2011	Switzerland	Local Delivery
Cabenamala	https://www.cabenamala.com.br/	2012	Brasil	Freight Forwarding
Co-Stockage	https://www.costockage.fr/	2013	France	Storage
Colis voiturage	http://www.colis-voiturage.fr/	2008	France	Freight Shipping
Dealtrötter	http://deal-trotter.com/	2015	France	Freight Forwarding
Deliv	https://www.deliv.co/	2013	US	Local Delivery
Deliveree	http://www.deliver.ee/	2014	France	Local Delivery
Doordash	https://www.doordash.com/	2013	US	Local Delivery
Easyvan by Lalamove	https://www.lalamove.com	2013	Singapore	Local Delivery
Entrusters	http://entrusters.com/	2014	US	Freight Forwarding
Expediezentrevous	http://www.expediezentrevous.com/	2011	France	Freight Forwarding
Friendshippr	http://friendshippr.com/	2013	US/Dubai	Freight Forwarding
Getbellhops	https://getbellhops.com/	2011	US	Freight Shipping
GoGovan	https://gogovan.com.hk	2013	Hong-Kong	Freight Shipping
Instacart	https://www.instacart.com/	2012	US	Local Delivery
jestocke	https://www.jestocke.com/	2013	France	Storage
Jib.li	http://jib.li/#/	2012	France	Freight Forwarding
Jwebi	https://jwebi.com/Home/	2014	France	Freight Forwarding
Kanga	http://getkanga.com/	2013	US	Local Delivery
Manyship	https://www.manyship.com/	2013	US	Freight Forwarding
Meemeep	https://www.meemeep.com/	2010	Australia	Freight Shipping
mmMule	http://www.piggybee.com/fr/	2011	Australia	Freight Forwarding
Monsieurparking	http://www.monsieurparking.com/	2008	France	Storage
Muber	http://www.muber.com.au/	2014	Philippin	Freight Shipping
Myways	https://www.myways.com/	2013	Sweden	Local Delivery

Nimber	https://www.nimber.com/	2010	Switzerland	Freight Shipping
Ouistock	https://www.ouistock.fr/	2014	France	Storage
Packmule	http://packmule.it/	2013	Italy	Freight Forwarding
Parcelio	http://www.parcelio.com/	2012	US	Freight Forwarding
PickApp	https://www.pickapp.pe/	2015	Peru	Local Delivery
Picknpass	http://www.picknpass.com/	2011	Israël	Local Delivery
Pickthisup	http://pickthisup.nl/	2014	The Netherlands	Freight Shipping
Piggybee	http://www.piggybee.com/fr/	2012	France	Freight Forwarding
Pleasebringme	http://pleasebringme.com/	2012	Turkey	Freight Forwarding
Postmates	https://postmates.com/	2011	US	Local Delivery
Rideship	http://www.rideship.com/	2014	US	Freight Shipping
Roadie	https://www.roadie.com/roadies	2014	US	Freight Shipping
Sharemystorage	http://www.sharemystorage.com/	2010	UK	Storage
Shipeer	http://www.shipeer.com	2014	Spain	Freight Shipping
Shipizy	http://www.shipizy.com/	2012	Portugal	Freight Forwarding
SocioTransit	http://sociotransit.com/	2013	Denmark	Freight Forwarding
Storemates	http://storemates.co.uk/	2012	UK	Storage
Storenexdoor	https://www.storenexdoor.com/	2012	UK	Storage
Stuart	https://stuart.com/	2015	France/Spain/UK	Local Delivery
Suppertime	http://www.suppertime.com.au/	1985	Australia	Local Delivery
TinyCarrier	http://signup.tinycarrier.com/	2013	US	Freight Forwarding
Toktoktok	https://toktoktok.com/	2013	France	Local Delivery
Ubereats	https://ubereats.com/paris/	2014	US	Local delivery
Uberush	https://rush.uber.com	2014	US	Local Delivery
Volo	https://www.volo.de/	2015	Germany	Local Delivery
Wunwun	https://www.wunwun.com/	2015	US	Local Delivery
Zaagel	http://www.zaagel.com/	2013	Egypt	Freight Forwarding
Zipments	https://zipments.com/	2013	US	Local Delivery